IDA PAPER P-2791

ALTERNATIVE APPROACHES TO ORGANIZING, TRAINING AND ASSESSING ARMY AND MARINE CORPS UNITS

Part II: The Reserve Component

John C. F. Tillson
Merle L. Roberson
Stanley A. Horowitz

November 1992

Prepared for
Office of the Assistant Secretary of Defense
(Force Management and Personnel)

INSTITUTE FOR DEFENSE ANALYSES
1801 N. Beauregard Street, Alexandria, Virginia 22311-1772

IDA Log No. HQ 92-43083

DEFINITIONS

IDA publishes the following documents to report the results of its work.

Reports

Reports are the most authoritative and most carefully considered products IDA publishes. They normally embody results of major projects which (a) have a direct bearing on decisions affecting major programs, (b) address issues of significant concern to the Executive Branch, the Congress and/or the public, or (c) address issues that have significant economic implications. IDA Reports are reviewed by outside panels of experts to ensure their high quality and relevance to the problems studied, and they are released by the President of IDA.

Group Reports

Group Reports record the findings and results of IDA established working groups and panels composed of senior individuals addressing major issues which otherwise would be the subject of an IDA Report. IDA Group Reports are reviewed by the senior individuals responsible for the project and others as selected by IDA to ensure their high quality and relevance to the problems studied, and are released by the President of IDA.

Papers

Papers, also authoritative and carefully considered products of IDA, address studies that are narrower in scope than those covered in Reports. IDA Papers are reviewed to ensure that they meet the high standards expected of refereed papers in professional journals or formal Agency reports.

Documents

IDA Documents are used for the convenience of the sponsors or the analysts (a) to record substantive work done in quick reaction studies, (b) to record the proceedings of conferences and meetings, (c) to make available preliminary and tentative results of analyses, (d) to record data developed in the course of an investigation, or (e) to forward information that is essentially unanalyzed and unevaluated. The review of IDA Documents is suited to their content and intended use.

The work reported in this document was conducted under contract MDA 903 89 C 0003 for the Department of Defense. The publication of this IDA document does not indicate endorsement by the Department of Defense, nor should the contents be construed as reflecting the official position of that Agency.

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	November 1992	Final

4. TITLE AND SUBTITLE
Alternative Approaches To Organizing, Training, and Assessing Army and Marine Corps Units, Part II: The Reserve Component

5. FUNDING NUMBERS
C-MDA 903 89 C 0003

T-L6-1057

6. AUTHOR(S)
John C. F. Tillson, Stanley A. Horowitz, Merle L. Roberson

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Institute for Defense Analyses
1801 N. Beauregard Street
Alexandria, VA 22311-1772

8. PERFORMING ORGANIZATION REPORT NUMBER
IDA Paper P-2791

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Assistant Secretary of Defense (Force Management and Personnel)
The Pentagon
Washington, DC 20301

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited.

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

This study comprises two parts. Part I develops alternative approaches to organizing the active component of the Army and Marine Corps in the face of anticipated budget cuts. Part II develops alternative ways of organizing, manning, and training reserve component combat forces.

Part I: One way to improve training readiness in active component units is to change Army and Marine Corps policies and keep people together in units longer. The Unit Stability Program is designed to achieve that goal. Ready Standby Organization provides a way for the Army and Marine Corps to preserve active component force structure and training readiness in the face of budget cuts.

Part II: The training readiness of reserve component combat maneuver units can be improved and their post-mobilization deployment times can be reduced. This will allow them to contribute more effectively to a short warning wartime scenario. Reserve readiness can be improved even further by improving simulator training of reserve units, especially in the key areas of battalion and brigade operations.

14. SUBJECT TERMS
active component, ARNG, cohesion, combat training center, mobilization, personnel management, post-mobilization, ready standby organization, regimental system, replacement system, reserve component, roundout, roundup, stability, training readiness, training

15. NUMBER OF PAGES
72

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UL

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. Z39-18
298-102

IDA PAPER P-2791

ALTERNATIVE APPROACHES TO ORGANIZING, TRAINING AND ASSESSING ARMY AND MARINE CORPS UNITS

Part II: The Reserve Component

John C. F. Tillson
Merle L. Roberson
Stanley A. Horowitz

November 1992

IDA

INSTITUTE FOR DEFENSE ANALYSES

Contract MDA 903 89 C 0003
Task T-L6-1057

PREFACE

This task was performed by the Institute for Defense Analyses for the Office of the Assistant Secretary of Defense for Force Management and Personnel, in fulfillment of Task T-L6-1057, Alternative Concepts for Organizing and Training the Army and Marine Corps.

This paper was reviewed by Dr. Herschel Kanter, IDA, and Mr. John Brinkerhoff, former Deputy Assistant Secretary of Defense for Reserve Affairs in the Office of the Secretary of Defense.

CONTENTS

APPENDICES

FIGURES

TABLES

SUMMARY

This study comprises two parts:

- Part I suggests alternative approaches to organizing the active component of the Army and Marine Corps in the face of anticipated budget cuts.
- Part II suggests alternative ways of organizing, manning, and training reserve component combat forces.

Training readiness[1] is key to both parts:

- Success on the battlefield demands high training readiness.
- Some personnel practices limit the ability to achieve high training readiness in active units.
- Budget cuts threaten to further reduce training readiness.
- The mix of active and reserve combat units is often determined by the speed with which reserve units can deploy and that speed is a function of perceptions of their training readiness.
- While training readiness is perhaps at an all-time high, there is no comprehensive, objective measure of training readiness in routine use by the Army or the Marine Corps to measure the training readiness of combat maneuver units.

PART I

One way to improve training readiness in active component units is to revise some Army and Marine Corps policies in order to build more personnel stability in units and keep people associated with units longer. The Unit Stability Program is designed to achieve that goal. It is built around these concepts:

- Keep units together longer.
- Employ a "Regimental system."
- Exchange the individual replacement system for a unit replacement system.

---

1 Training readiness is a measure of a unit's ability to perform its mission-essential tasks to a defined standard.

- In wartime, return former unit personnel to their unit to act as fillers and combat replacements.

Ready Standby Organization appears to provide a way for the Army and Marine Corps to preserve active component force structure and training readiness in the face of budget cuts. Ready Standby Organization is built around these concepts:

- Create fully equipped "Standby" units that are manned in peacetime by fully trained people who have other peacetime assignments or who have left the active component.
- In a crisis or war, recall the members of the unit to the unit and, following limited refresher training, send the unit to war.

Both the Army and Marine Corps could react to budget cuts by placing approximately 25% of their active component force structure into Standby status.

The Unit Stability Program and Ready Standby Organization could be implemented together or singly.

PART II

This study indicates that the training readiness of reserve component combat maneuver units could be improved and their post-mobilization deployment times reduced. This would allow them to contribute more effectively to a short warning wartime scenario. Ways to reduce post-mobilization deployment times fall into 6 major areas:

- Reduce the number and difficulty of the tasks reserve units are expected to be able to carry out;
- Improve the skill levels of personnel serving in reserve units;
- Provide additional training time;
- Use more effective training techniques;
- Reduce administrative impediments to effective mobilization;
- Train in the combat theater where possible.

Preliminary analysis of one of these approaches—the use of more simulator training—suggests a potential for making significant reductions—between 20% and 40%—in current estimates of post-mobilization deployment times of reserve combat units.

Review of simulator training concepts and technologies indicates a potential for further improving simulator training of reserve units, especially in the key areas of

battalion and brigade operations. This new approach to simulator training involves the merging of virtual and constructive simulation—SIMNET and Janus—and the use of both local and wide area data transmission networks.

This report represents an initial effort to define new organizational and training approaches for the Army and the Marine Corps. Work to date on the concepts described in both Part I and Part II describe possibilities for making significant improvements in the training readiness of both the Active and Reserve Components of the Army and the Marine Corps and for preserving Active Component force structure and training readiness in the face of impending budget cuts. Implementation of these concepts would require the Services to develop detailed plans and cost estimates. Much of the data needed for these more detailed plans and cost estimates is available in Army and Marine Corps records such as those of the Army COHORT experiment and the Marine Corps Unit Deployment Program. Reorganizations and reductions already underway can provide opportunities for testing some of these concepts in the near term.

I. OVERVIEW OF THE STUDY

A. THIS STUDY HAS TWO GOALS

- Develop alternative approaches to organizing the active component of the Army and Marine Corps that will allow both Services to preserve force structure and training readiness despite anticipated cuts in resources and OPTEMPO (Part I).
- Develop and analyze alternative ways of organizing, manning, and training reserve component combat forces that will allow them to better serve the nation's needs (Part II).

B. CHANGES IN THE WORLD MAKE THIS STUDY IMPORTANT

- The defeat of communism, the end of the Cold War, and the end of the Soviet Union call for new approaches to organizing and training U.S. forces to obtain the best return for the increasingly scarce resources that will likely be available.
- Future battlefields will be very challenging and U.S. forces must be organized and trained for success on those battlefields.

C. FUTURE BATTLEFIELDS WILL LIKELY BE CHARACTERIZED IN THE FOLLOWING WAYS

- The scale of future battlefields will be smaller than what we planned when the Soviet Union was our main enemy, but the intensity will likely be the same.
- Highly complex, nonlinear operations will require high levels of individual and collective skills in operating individual weapon systems and in synchronizing the operations of a large number of small units and complex battle systems.
- High intensity combat—24 hour per day operations with 2 or 3 times as many combat "pulses" per day as in WWII—and the need to sustain operations for a period of days or even weeks (the plans for the Gulf War envisioned a period of intense combat for several weeks) will place extreme physical and psychological stresses on individuals and units.

- Increasingly capable reconnaissance and fire systems will force ever greater dispersion on the battlefield and will call for small unit excellence in order to overcome the isolation and decentralization that comes with dispersion.
- The fluid, compartmented nature of war will place a premium on sound leadership, competent and courageous soldiers, and cohesive, well-trained units. Decision making will be decentralized and subordinate leaders will be expected to act on their own initiative within the framework of the commander's intent.[1]

D. THE FUTURE BATTLEFIELD HAS IMPLICATIONS FOR TRAINING AND ORGANIZING U.S. FORCES

- Any U.S. forces committed to a future battle must be at the highest level of training readiness possible.
- American maneuver warfare doctrine (Army AirLand Operations, USMC maneuver war) demands the very highest possible combat abilities in units at the point of main effort and allows for follow-on forces that are less capable.
- Combat operations that involve greater dispersion, decentralized decision authority, and the ability to concentrate forces at the point of main effort lead to increased demands upon individual soldiers, combat vehicle crews, squads, platoons, and companies.
- Orchestrating and coordinating greater numbers of small units and decentralized decision making require more all-arms integrated training and greatly increased synchronization skills for commanders and staffs.
- The number and complexity of tasks that forces will be asked to perform will continue to increase.
- Some forces must be trained and ready to fight and win the first battle of a war that comes with little warning.
- There must be sufficient total forces to meet potential worldwide demands for U.S. forces—the need for overwhelming force.
- The forces must have the staying power, with or without conflict, to remain in place for long enough to achieve their objectives.

---

1 FM 100-5, Department of the Army, 1986, pp. 4,5.

E. UNDERSTANDING TRAINING READINESS IS KEY TO REACHING THE GOALS OF THIS STUDY

- Training readiness is a measure of a unit's ability to perform mission-essential tasks in increasingly difficult conditions to predetermined standards.
- Current measures of training readiness are primarily subjective.
- Evidence from Army field training exercises using tactical engagement simulations (TES)[2] indicates that the odds of a successful attack are dramatically increased when the attacker has a significant advantage in his level of training.[3]
- Current practice calls for units to be at a minimum acceptable level of training readiness before deployment.
  - — Active component combat units are assumed to be at minimum acceptable level at virtualy all times.
  - — Reserve component combat units must demonstrate their ability before deployment.

F. CONSTRAINTS ON ACHIEVING HIGH LEVELS OF TRAINING READINESS

Both Services do the best training they know how to do within their systems. Both seek to train their units to standards that are achievable by units that must operate within their systems. These systems are characterized by important constraints:

- Both Services will have increasingly limited resources to support training and maintain OPTEMPO. They must find ways to make the best possible use of these resources.
- Both Services use a replacement system that places higher priority on individuals and on individual development than on units and unit development. This system continuously moves trained people out of units and replaces them with people who are unfamiliar with and untrained in the

---

2 TES can include a number of different types of simulations whose most important characteristic is the use of a sentient opposition force that provides immediate reward and punishment tactical performance through real-time casualty assessment. TES can be used to train units in the field with actual military personnel and vehicles, or in computer-based virtual simulation (SIMNET) with actual military personnel or on a computerized battle simulation to train commanders and staffs. The use of Observer/Controllers is also key to successful TES.

3 Roland J. Hart & Robert H. Sulzen, "Comparing Success Rates in Simulated Combat," *Armed Forces and Society*, Vol 14, No. 2, Winter 1988. The odds of success for a platoon attack were increased by 30 to 1 when the attacker was relatively well trained compared to the defender.

unit. In essence, this system creates new units every year or so and these new units must begin their training cycle over and over again.[4]

- Both Services must maintain high operational tempos in their combat units in order to train their units to minimum acceptable standards.
- All units have limited time available for training. This is especially true in the reserve component.

G. THE STRUCTURE OF THIS PAPER

This paper addresses a number of alternative ways to organize and train U.S. Army and Marine active and reserve combat forces. These alternatives are designed to allow them to adjust to cuts in resources and to reach and maintain levels of training readiness that are appropriate to the demands facing the Army and Marine Corps.

Chapter II provides an analysis of the concept of training readiness and the training strategy that the Army and Marine Corps employ today. It also addresses major organizational and operational concepts that are important to the study. This chapter serves as a base for the analysis that follows in Parts I and II.

Part I focuses on the Army and Marine Active Component and comprises Chapters III, IV, V, and VI. Chapter III describes an approach to the organization of military forces that is designed to enhance the stability of personnel within units and, thereby, to enhance their training readiness. Chapter IV describes a new organizational concept that is designed to allow the Army and Marine Corps to preserve force structure despite anticipated cuts in funding. Chapter V describes specific ways these concepts can be applied to the Army. Chapter VI describes how they can be applied to the Marine Corps.

Part II describes a number of potential ways to improve the training readiness and reduce the deployment times of Army National Guard combat maneuver units and, by implication, a full range of other reserve units. Part II repeats Chapters I and II and includes Chapters VII and VIII. Chapter VII suggests a number of changes in policies and practices that should enhance the ability of ARNG units to improve their level of

---

[4] When soldiers and Marines in combat maneuver battalions move from job to job within a battalion-size unit or move from unit to unit, the impact of this movement is called turbulence. ARI research has shown turbulence of 8 to 10 percent per month in units that return from a training experience at a Combat Training Center (CTC). The impact of this turbulence is that the unit capabilities that are built at CTCs are rapidly lost and the greatest training value of the CTCs is for individuals rather than units.

training readiness and to reduce the time it takes them to deploy overseas in an emergency. It also suggests ways to use simulation and computer-aided instruction to assist in training RC units and makes an initial assessment of the potential impact of such training on improving pre-mobilization training readiness and reducing post-mobilization training times. Chapter VIII suggests a new approach to using distributed, interactive simulation to improve the training of ARNG battalion, brigade, and division staffs.[5]

---

5 Chapter VIII describes hardware and software solutions to the new Battle Command Staff Training concept developed by LTG F. D. Brown in an IDA study currently underway. IDA paper, forthcoming.

II. TRAINING, ORGANIZATIONAL, AND OPERATIONAL CONCEPTS SUPPORTING TODAY'S FORCE

Understanding the training, organizational, and operational concepts that both Services operate under is key to understanding the issues addressed in this study. These concepts affect the world view of Service leaders and affect their decisions. This chapter discusses some of these concepts. Parts I and II that follow this chapter are designed to be consistent with the Services' training and operational concepts while it suggests changes in their organizational concepts that are intended to help both Services adjust to the needs of the post-Cold War world.

A. TRAINING THEORY

Since the Vietnam War, both the Army and the Marine Corps[1] have undergone a revolution in their approach to training combat units. From before WWII until shortly after the Vietnam War, both Services provided training that was demonstrably inadequate for the needs of combat units.[2] The dramatic changes in training began in the 1970s when both Services recognized that something had to be done.

The use of repetitive tactical engagement simulations (TES) in field training has been central to the improvements in training. Both Services have research showing that combat units accomplish more missions, sustain fewer casualties, and inflict more casualties when they conduct repetitive field training using TES. Evidence from 237 Army platoon battles conducted using TES over a period of 10 years demonstrated that the odds of a successful attack were 30 to 1 when the attacker was relatively better trained in the offense than the defender was trained in the defense.[3]

Other evidence indicates similar but less dramatic impact at higher organizational levels. In 58 battles conducted by combined arms (company) teams of equal size," the

---

1 While most of the specific references are to Army training, our information is that Marine Corps training suffered from many of the same problems and began its revolution at about the same time.

2 Gen. Paul Gorman (Ret.), *The Secret of Future Victories*, IDA P-2653, February 1992.

3 Roland J. Hart & Robert H. Sulzen, "Comparing Success Rates in Simulated Combat," loc. cit.

teams receiving more TES training had a 15 to 1 greater chance of successfully attacking a combined arms team receiving less training." In 428 battles at the National Training Center (NTC) where the opposition force (OPFOR) was always considered to be the better trained force and the attacker always attacked with a 3 to 1 advantage, "the TES-trained OPFOR motorized rifle regiment had a 5 to 1 greater chance of attacking and defeating a less-well-trained Army (battalion) task force than the Army task force had of successfully attacking and defeating an OPFOR unit."[4]

Today the Army and the Marine Corps both place top priority on using TES in the field and in computer simulations. The Army is continuing to make major investments in both forms of TES. Although hard evidence is scarce on the impact of TES in computer-based virtual simulation, the Army is making a major investment in the Close Combat Tactical Trainer (CCTT) for training heavy forces.

In addition, both Services conduct performance-oriented training that demands actual performance on key tasks. Both Services focus on training units to perform tasks that are part of each unit's Mission Essential Task List (METL). Most units have a demanding set of tasks they are required to be able to perform. For example, the Army manual for the tank and mechanized infantry company and company/team lists 7 distinct missions and 55 tasks that could be part of the unit's METL. Both Services call for units to train in these tasks in increasingly difficult conditions such as day and night, good and bad weather, and increasingly difficult terrain and competent enemies. And they both have prescribed minimum acceptable performance standards to which their units train and against which a unit's performance is evaluated.[5]

Both Services recognize that training readiness varies over time. Figure I-1 is a picture of the Army's view of this phenomenon.[6] It shows training readiness varying as units go through a training cycle designed to sustain some level of proficiency. The picture compares a vision of the traditional training strategy that arguably allowed units to vary greatly in their training readiness—peaking at major training events and implicitly dropping to unacceptable levels at other times—with the current Army strategy that calls

---

4 Col. Robert H. Sulzen, "Winning with Tactical Engagement Simulation," *Military Review*, May 1987, pp. 8-19.

5 These standards are both objective and subjective. For example, the standards for a tank/infantry team attack are," 1. Main body is not surprised or fixed; 2. No more than 20% casualties or 50% vehicles lost; 3. Accomplish assigned task within commander's intent; 4. 100% enemy KIA, POW or forced to withdraw; 5. No fratricide."

6 Army Field Manual, "Training the Force, FM 25-100.

for sustaining a level of training readiness which varies only marginally and, for active component forces at any rate, should never allow a unit to drop below a minimum standard of training readiness.

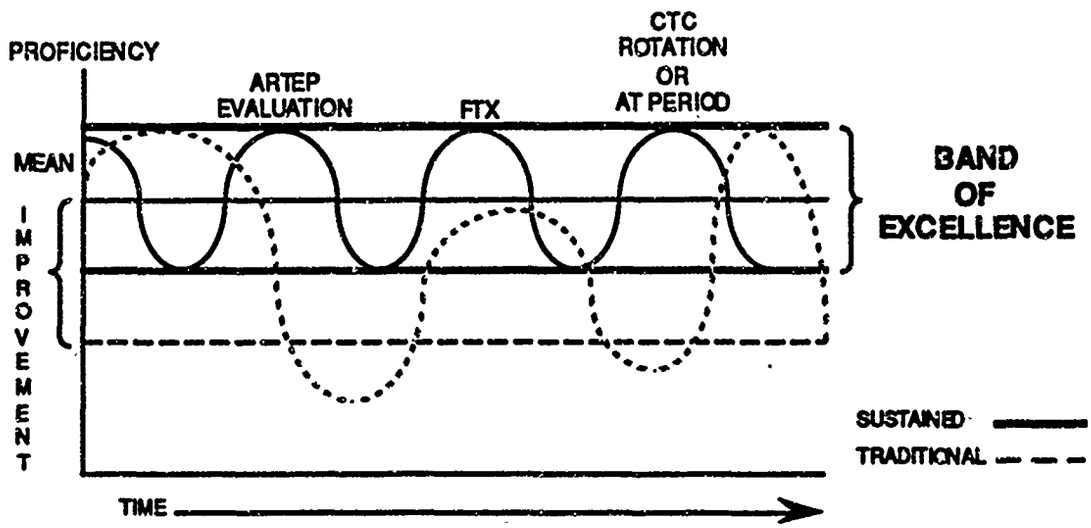


Figure II-1. The Army's View of Training Readiness

The discussion of this schematic in FM 25-100 describes the Army's training strategy as intended to provide training in key skills often enough "to prevent skill decay and to train new people." However, the manual does not describe how this will be accomplished by units within the time and resources available, while adjusting to typical levels of personnel turbulence, and whose new members are not fully trained in their individual skills. Nor does it describe the meaning of the "Band of Excellence." Since outside evaluations of unit training readiness are generally made only during prime training events such as at a Combat Training Center (CTC) or formal readiness evaluation, it is difficult to demonstrate that the current strategy leads to less fluctuation in training readiness than does any "traditional" strategy.

In addition, while the Combat Training Centers provide excellent training, that training does not necessarily cover all the tasks on a unit's Mission Essential Task List. Indeed it seems likely that units preparing for a CTC training period will not train on

tasks they do not expect to be covered during their CTC rotation.[7] As a result, units that may be well trained in tasks that are trained at the CTC may be untrained in other important tasks. The high level of turbulence that units traditionally suffer upon returning from a CTC is also likely to reduce unit training readiness levels.[8]

Both Services recognize that combat operations, particularly combat maneuver operations, are extremely complex. Accordingly, both have established systems for conducting formal readiness evaluations. The Army's system is called the Army Training and Evaluation Program (ARTEP); the Marine system is called the Marine Corps Combat Readiness Evaluation System (MCCRES). Both systems include a pass/fail system for evaluating a unit's ability to perform each of its assigned tasks. Units that perform to these standards are declared "trained" and units that do not are "untrained or partially trained." Both Services provide evaluations of training that include a "trained-untrained" assessment associated with specific tasks, but the evaluation process is primarily intended and employed to provide diagnostic feedback that will enhance and reinforce the training experience. Nevertheless, the ARTEP and the MCCRES do give each Service the ability to state with assurance that a unit has demonstrated a capability to perform its mission-essential tasks to a minimum acceptable standard.

There are four main problems with both evaluation systems:

- They are tied to performance standards that lead to risk averse behavior, i.e., the "school solution;"
- They are applied infrequently and, because of personnel turbulence, represent an accurate picture of a unit's capabilities for only a short period of time;
- They measure only minimum acceptable capabilities; and
- They are only partially based on objective, or measurable, standards.

In addition to these problems, neither Service employs its training evaluation system to compare one unit with another, either within a component or across components. Both Services argue that comparisons of units are inappropriate. They further argue that no fair comparison can be made because the METL for units are

---

7 Analysis by the Army Research Institute on the determinants of combat performance indicates that the most successful units tend to be those that limit training to a small percentage of their METL tasks. ARI newsletter, October, 1992.

8 The Army might demonstrate the effectiveness of its training strategy by returning a unit to the NTC without warning some 3 to 6 months after it completed its last rotation and evaluating the changes in training readiness that occur over that time. A complete evaluation might include some tasks that were trained at the CTC and some that were not.

further argue that no fair comparison can be made because the METL for units are different, because the conditions under which the tasks are performed are different, and because the standards call for subjective judgments that cannot be applied evenly from unit to unit because the skills and focus of the evaluators vary greatly.

The Army also makes no systematic effort to evaluate one unit against another in the Army's combat training centers, such as the National Training Center. In the NTC where tasks and evaluators are more likely to be consistent over time, the Army varies conditions in order to provide the best training to units, depending on their level of training when they arrive at NTC—thus making comparisons invalid. The Army also argues that comparison of units would reduce the training value of the experience. The Army does have data that would allow for such a comparison.[9]

The only Service-wide comparison in use is the unit readiness report that assesses training readiness by having unit commanders subjectively rate their unit's capabilities to perform a unit-specific set of METL tasks and estimate the additional training necessary to be prepared for combat.

The net result of current practice is that neither Service has an accepted way for making comparisons of the training readiness of active and reserve units. Nor do they have a way of objectively determining the time or resources needed to improve an untrained unit or to say how much a unit's training readiness could be improved with additional training.[10] The only data available are derived from the experiences during the Gulf War mobilization of 3 ARNG brigades. While these data are a useful historic example, they are insufficient to provide an objective way to compare pre-invasion AC and RC training readiness or to compare post-invasion AC and RC training experiences. Many members of the ARNG consider the data derived from the mobilization of the three

---

9 This discussion has described the Army and Marine Corps approach to tactical training of combat units. It does not describe their approach to gunnery training. Unit performance in gunnery is objectively evaluated, scores are compared across units, and units that perform well are rewarded. Training standards in gunnery are rigorously adhered to for both crews and platoons. Gunnery training involves extensive training on simulators, such as the Conduct of Fire Trainer (COFT), followed by training on gunnery tables with fixed conditions and on which performance to standards is carefully measured. Gunnery training standards, like tactical training standards, are set to a minimum acceptable level—Table VIII—but the gunnery training and evaluation system does allow for measurement of performance that greatly exceeds those minimum standards. Gunnery simulators provide one of the best ways for evaluating master level performance.

10 When reading evaluations of both active and reserve component units and discussing the issues with experts, the IDA analysts have been struck by the similarity of the comments regarding the problems of both active and reserve units.

ARNG brigades as biased and unreliable. Among the factors that lead to this judgment are:

- The standards for deployment were changed from C-3 to C-1 without warning.
- The units were put into a "lock-step" training program unrelated to pre-mobilization plans on training.
- There was little or no "evaluation" until the end of the training process.
- Many training events were required, regardless of the demonstrated competence of the units.
- The post-mobilization training was conducted by active component personnel unfamiliar with the units or their capabilities.

It is a fact that during the mobilization for Operation Desert Shield, active component units were assumed to be ready for deployment and reserve component units were required to demonstrate that they were ready. During the mobilization, both the Army and the Marine Corps found themselves conducting ad hoc evaluations of the training readiness of the RC combat maneuver units they mobilized and then developing ad hoc plans for post-mobilization training. The Marines provided minimal training for their RC combat units and then deployed them. The Army changed its policy that had called for combat units to be deployed when they met C-3 standards and required them to meet C-1 standards before deployment. Given this change in policy, the Army then had to develop a plan for training the ARNG units to the new standard. After reviewing the experiences of RC units in both Services, it appears that determinations of training needs can be a function of the need a Service has for the unit in question as much as it might be a function of an objective measure of a unit's training readiness.[11]

Both Services are working to improve their training and evaluation systems. The Army has a number of programs under way to identify the training that its units need to undergo in order to be competent in a range of common tasks (this program is known as the Combined Arms Training Strategy (CATS)). The Army also has programs to

---

[11] In planning for a worldwide war with the Soviet Union, for example, plans called for reserve component units to train until the time came for them to deploy—less than 60 days for most RC brigades and even some divisions. In the Gulf War, the Marines had specific needs for their RC infantry and tank battalions and deployed them overseas with relatively little training. The Army had an immediate need for the two RC artillery brigades and deployed them rapidly to the combat theater. It had no immediate needs for the three RC maneuver brigades it mobilized and decided to assure they met a high training standard before validating them for overseas deployment.

improve the training readiness of reserve units (these programs are collectively addressed under the title "Bold Shift") and to develop a way of providing an objective comparison of the training readiness of like units regardless of their component (this program is known as Operational Readiness Exercise (ORE)).[12]

The Marines also are working on a number of initiatives to improve training readiness. They are developing a "Mission Essential Training Strategy" that will identify specific training needs of Marine units. They also are making changes in the Selected Marine Corps Reserve to improve its training readiness.

If these programs are successful, both Services should have better trained units, they should know that they are better trained, and they should be able to differentiate between units based on their training readiness. These are ambitious goals and success is not assured. Even with these improvements in training, a number of problems will remain:

- Neither the Army nor the Marine Corps will know if there is a practical limit to improving training readiness or for saying how good a unit can be.
- Neither Service is likely to be able to set a training goal beyond the minimum acceptable level.
- Neither will have a theory for describing the impact of different levels of training readiness on successful implementation of Army AirLand Operations or Marine maneuver warfare doctrine.
- Neither will have a theoretical basis for determining if the new concepts and changes in policy and organization described in Parts I and II below will improve their training readiness or decrease their post-mobilization deployment times.

B. ORGANIZATIONAL AND OPERATIONAL CONCEPTS

The Army and Marine Corps today are undergoing dramatic changes due to the end of the Cold War. The nature of many of those changes is still to be determined. Many changes will involve reductions in the size of the active and reserve components of both Services. No dramatic new organizational or management changes are visible at this time. The organizational and operational concepts that are particularly important to this

---

12 Evidence to date indicates an ORE focuses more on input than output or performance measures.

study are listed below. The key elements and the importance of each concept are described.

1. Maneuver Warfare

Although both Services have changed their operational concept from attrition or linear warfare to maneuver warfare, neither Service has changed its organization or its personnel management system in any major way to align with the change. Both Services expect all combat units to meet the same minimum acceptable standards. Both retain the traditional hierarchical structure. Neither has specifically recognized a need to have some units that are trained to much higher standards at the point of main effort. This study describes ways to improve the training readiness of some units significantly. It also argues that not all AC or RC units need to meet the same standards.

2. Total Quality Management

Both Services have adopted the concept of Total Quality Management for managing their peacetime activities. TQM can be described as the peacetime equivalent of maneuver warfare. Both Services seek to loosen the hierarchical bounds of existing management structures and to empower the lower levels of the organization to make their own decisions. As in maneuver warfare, neither Service has realized the full implications of TQM. For example, neither Service has yet decentralized the personnel system or eliminated the "zero defects" approach to the management of combat units. This study suggests a TQM approach to personnel management.

3. Individual Replacement System

Both Services base primary reliance on an individual replacement system in peace and war. Commanders and personnel managers appear to be more concerned about "equity" for individuals than for units. In Korea and Vietnam, they supported a 12-15 month tour despite the impact it had on the war-fighting capabilities of units. In the Gulf War, the Army made an ad hoc effort to use crew replacement rather than individual replacement. The Marine Corps planned to use individual replacements. Although both Services have often acknowledged the damage to units that is caused by the current system, they have allowed it to continue in most instances in both peace and war. This study proposes the elimination of the major elements of this system.

4. Overseas Deployments

Planning for overseas deployments has dominated the personnel and training systems in both Services. As overseas deployments decline, the impact on personnel and training should decline. This study proposes that overseas deployments be supported by unit rotation.

PART II
THE RESERVE COMPONENT

VII. ENHANCING RESERVE READINESS AND REDUCING DEPLOYMENT TIMES

A. INTRODUCTION

Determining the appropriate mix of active and reserve forces to meet the military requirements of the United States requires us to consider not only the readiness and post-mobilization deployment times of reserve units today, but also the possibility that changes can be made to enhance their readiness or otherwise reduce their deployment times in the future. If we are able to maintain reserve units at higher levels of peacetime readiness, to improve our ability to train reserve units following mobilization, or to reduce other impediments to their deployment, then it will be possible to deploy them more quickly. With more rapid deployment times, reserve units might be able to meet more of the requirements of the scenarios that form the basis of force structure planning. Less post-mobilization administrative and training time might allow reserves to handle scenarios that would otherwise be infeasible for them. This would allow reserves to be a larger part of the mix of forces. Because of the cost advantage reserve forces generally enjoy relative to active forces, we could save money without sacrificing critical capability.

This chapter discusses a variety of mechanisms by which reserve training readiness could be enhanced and overall post-mobilization deployment times could be reduced. Because of the Services' inability to measure unit readiness or relate policy options to expected levels of readiness in a quantitative fashion, it is generally impossible to develop analytically based estimates of how policy changes would affect the required post-mobilization training time of reserve units. In one particular case (greater use of simulator technology in the training of Army National Guard armor units), however, an estimate of how much it might be possible to reduce post-mobilization train-up time is provided. While this estimate is necessarily quite imprecise, it is consistent with the notion that modifications in RC management policies and training practices could significantly reduce post-mobilization deployment times.

B. FACTORS THAT INFLUENCE READINESS IN THE RC

Table VII-1 illustrates the point that there is considerable variation in the readiness of RC units to deploy. The information in the table comes from several sources such as questionnaires that were sent to each of the units and discussions with the leadership of the units. The data are not entirely consistent across units. For example, the "Days to Deploy" is the unit commander's estimate, except in the case of the 20th SFG and the 48th Brigade where deployment times have been validated by the AC. The entry for "% Full Time Support" does not include the full time support associated with equipment maintenance. All units but one claimed 39 days per year of unit level training plus additional training for pilots, officers, and some NCOs. Entries in the column, "Mission related to AC" are provided by the reserve units. LMI provided some of the data on the extent of MOS mismatches and on the amount of full time support.

Table VII-1. Readiness and Other Characteristics of Some Reserve Units

UNIT	Days to Deploy	Level of Org.	% FTS Res/ Act	% Prior Service	Peacetime Training days/yr.	Mission rel. to AC	% MOS Mismatch
1/174 Fighter	3	Squadron	8/0	68	53-pilots 39 unit	Less	0
1/168 Aviation	45	Battalion	6/0	51	53-pilots 39 unit	Same	15
1/20th SFG (25% over str)	7-45	Battalion	7/0	35	70+ Off &NCO	Same	15
1/25 Marines	20	Battalion	1/5	100-Off 0-Pvts.	39 all	Same	9
1/142 Artillery	18-21	Brigade	11/0	7	70 Off 56 unit	Less	6
48th Brigade	90	Brigade	4/0	13	59 Off 39 unit	Same	26
1-108 Armor 48th Bde	30	Battalion	4/0	27	57 Off 39 unit	Same	14

Several factors appear to be associated with more rapid deployment:

- Units that can deploy with less post mobilization training tend to have more full time support, more prior-service personnel, and a higher level of peacetime operating tempo than do other units.
- They tend to be smaller and, as in special forces and aviation units, they tend to be units in which individual and team-level skills are most important compared to inter-unit coordination skills.
- They seem to be assigned less demanding missions than comparable active units.

It is not always possible to discern in the table the relationships that one might expect. For example, there is at most a very weak relationship between the number of days to deployment and the extent of MOS mismatch (though we still believe that such a relationship exists).

C. POSSIBLE WAYS TO REDUCE DEPLOYMENT TIMES

Our analysis reveals six major ways in which post-mobilization deployment times for ARNG combat maneuver units can be reduced:

- reduce the number and difficulty of the tasks reserve units are expected to be able to carry out;
- improve the skill levels of personnel serving in reserve units;
- provide additional training time;
- use more effective training techniques;
- reduce administrative impediments to effective mobilization;
- train in the combat theater.

Policy initiatives that fall into each of these categories are discussed in turn. It should be borne in mind that the kinds of initiatives discussed here are not only relevant to units that fail to meet specified readiness standards; all units can use these initiatives to reduce their post-mobilization time.

1. Reduce The Number and Difficulty of Required Tasks

Plan to deploy smaller, lower-echelon units. This would eliminate some of the burden of training complex, high-level synchronization tasks. In general, the lower the level of the unit, the fewer and the less complex are the mission-essential tasks facing the

unit. Companies have a less complex Mission Essential Task List (METL) than do battalions and battalions have a less complex METL than do brigades. For example, in an indcpendent brigade such as the ARNG roundout and roundup brigades, the maneuver battalions have a primary responsibility of managing the maneuver of three or four company/teams of tanks and infantry fighting vehicles in the battalion. The brigade, on the other hand, must manage the maneuver of the battalions and also of the other disparate units. The brigade must also integrate that function with all the other functions, particularly the fire support, air defense, command and control, intelligence, and combat service support functions.

Because of their less complex METLs, total pre-mob and post-mob training time would be reduced if plans were made to deploy lower echelon units, such as battalions instead of brigades or brigades instead of divisions. There are two alternative ways of implementing such a decision. First, given the uncertainties of future crises and the current emphasis on assuring the readiness of crews, platoons, and companies during pre-mob training, reserve units could be assigned a dual mission. Reserve units could be directed to prepare for deploying lower echelon units in a short warning, rapid deployment crisis and to prepare to deploy as a larger unit in a crisis that had longer warning or a less demanding deployment schedule. Such a decision would provide for maximum flexibility and is consistent with current training philosophy.

Alternatively, plans could be made for deploying only battalions and companies. This is the approach the Marine Corps uses. The higher headquarters units could be assigned the job of managing training and administration, or they could be eliminated. Since someone has to train and administer these units, it probably would be appropriate to maintain the higher headquarters to manage these jobs. Following the deployment of the lower echelon units, the higher headquarters could be used as the nucleus of new units or their personnel could be used to meet other needs.

Train to specific, but more limited METLs. Reviews of reserve units' Mission Essential Task Lists indicate that they typically include the same missions as the active units plus tasks associated with mobilization. The alternative to these very demanding METLs is to assign fewer tasks. Such a decision would be consistent with the Army's manual on "Training the Force" which states, "Recognizing the limited training time available to RC units during peacetime, wartime commanders assign missions that are as specific as possible. Mission specificity limits the range of possible RC mission-essential tasks and allows the RC to achieve Army standards on each training

task."[1] Training to a more limited METL also would be consistent with the Army's AirLand Operations Doctrine which calls for very capable units at the point of main effort, but also allows for units of lesser capabilities for missions that are less demanding. This practice is followed by the most successful AC brigades that attend the NTC who train to a limited number of tasks.[2]

This approach also would be consistent with the experience in the Gulf War in which the AC units in Saudi Arabia and the mobilized brigades in CONUS trained in a limited number of METL tasks. That ARNG brigades trained in less demanding METL tasks could have been used effectively in the Gulf War has been attested to by the former G3 of the First Armor Division, who argues,

> "The presence in theater of the roundout brigades in a reinforcing role would also have increased the CINC's and the Army Commander's options and maneuver flexibility. They would have been available to secure forward deployed army and corps-level supply dumps, critical lines of communication, and conduct forward defense along the Saudi-Iraqi border in both the VII and XVIII Corps' areas of operation. As heavy maneuver forces, the roundout brigades would have been most valuable to both the VII and XVIII Corps commanders during the ground phase of Desert Storm, ensuring security for LOCs that extended between 150-400 kms into Iraq."[3]

Reorganize to provide simpler units. The independent brigades in the ARNG are complex units with many different kinds of sub-units. This organization leads to complex and demanding METLs. It is possible to organize simpler reserve units and to look to the active parent unit to provide the skills needed to synchronize the efforts of different kinds of units. The roundup/roundout brigades have infantry and armor maneuver battalions, an artillery battalion, a forward support battalion, an armored cavalry troop, plus air defense, engineers, signal and other capabilities. These brigades are to join active divisions and could be organized as divisional brigades with just armor and infantry battalions. The other units could also remain in the reserves, but the responsibility for managing them would be given to the active division. This would reduce the peacetime demands on the brigade staff which should have more time to assist in the training of the maneuver units and in its own battle staff training. The brigade staff

---

1 FM 25-100, *Training The Force*, November 1988, p. 2-5.

2 Preliminary findings of an ARI study on "The Determinants of Unit Performance."

3 Col. Thomas J. Strauss, *The Role of the U.S. Army's National Guard Roundup and Roundout Brigades in Force Reconstitution*, U.S. Army War College, Carlisle Barracks, PA, 1992, p 29.

would still have the wartime responsibility for operating as a divisional brigade and for operating all of its battlefield operating systems.

2. Improve The Skill Level of Personnel

Fully train non-prior-service soldiers. The majority of soldiers who complete initial entry training (IET) are not fully trained in the jobs they will be expected to do when they arrive in their units. This is acceptable in the active component because there is time to train these individual skills in the unit. It is unacceptable in reserve component units because they do not have the training time available. Failure to fully train reserve soldiers in initial entry training means that most will never catch up.

Special provisions could be made to train reserve personnel either at their IET school or at a reserve school to assure their ability to perform their jobs when they arrive at their units. The potential impact of this provision would be to reduce the amount of individual training that is necessary in the reserve unit. Special provisions might be made, for example, to fully train tank or APC crewmen as part of their IET. If they could be trained as full crews, so much the better.

The Marine Corps fully trains its infantrymen in initial entry skills before they arrive at their units. This training takes 22 weeks. The Army, on the other hand, provides its infantrymen less than the full inventory of skills they need in 14 weeks of initial entry training. This 8-week difference,--40+ training days,--equals at least the first year of service (39 days of training) for an ARNG infantryman.

Increase the fraction of prior-service personnel. Many reserve units have few members with experience in the active component. This is especially true for those who have reached more senior levels in the active force. Increasing the fraction of prior-service personnel could increase the level of unit readiness regardless of the training strategy and training time available and could have the extra benefit of reducing MOS mismatches.

Although the reserves recruit prior-service personnel aggressively, there have been difficulties in recruiting senior personnel and in recruiting those with the proper MOS. The problem with more senior personnel is that reserve units are generally fully manned at the senior ranks and do not have room. Moreover, there is a natural tendency to prefer people who are known over people who are unknown, particularly because many units have had the experience of enlisting a person who turned out not to have the

capabilities and skills they anticipated. The problems with MOS mismatch arise because reserve units are geographically oriented and it is often difficult to recruit people with the right skills in the right geographic area.

There are a number of different ways to overcome these problems.

- To increase the number of senior prior-service personnel, allow reserve units to maintain these senior prior-service personnel, officers, and sergeants in an overstrength status for 1 or 2 years to allow them to become known to the unit, to demonstrate their skills and abilities, and to compete for openings as they arise in the units. If commanders are seriously motivated to train their units to standards, they will be motivated to select and promote the most qualified personnel.
- To increase the number of prior-service officers, require that individuals spend some time in the active component before they join the reserve component as an officer. The Marine Corps Reserve accepts only officers with prior active service as an officer, for example. Similarly, Army units with special readiness needs could be required to use only personnel who had relevant prior active service.
- It should be possible to enhance the MOS match of prior-service personnel by making provisions for them to attend the appropriate MOS schools immediately before separation when they have made a commitment to join a reserve unit.

Reduce MOS mismatches by developing distributed, decentralized training courses that can be delivered via paper, computer, videodisc, CD-ROM, video, etc. to counteract the inability of RC personnel to make large blocks of time available for traditional schooling.

Reduce turbulence or increase stability in units by allowing more flexible assignment and training policies.

- Recognize that moves associated with civil life will often take soldiers trained in key skills so far from their units that regular participation in training will be difficult. Allow some soldiers to remain in their units as long as they continue to train with the units on annual training and periodically (say, once a quarter) at weekend training. For the rest of their drills, they could perform individual training and administration at local armories. Such a policy would only be appropriate for soldiers with key skills who are not necessary at all Unit Training Assemblies, e.g., mechanics, radio/radar repairmen.

- Current personnel practices, many of which are based on AC concepts, militate against efforts to build crew and unit stability and cohesion in the RC. Promotion and other policies that force the most capable and ambitious soldiers and officers to leave positions for which they are qualified and enter positions for which they are relatively unqualified should be changed. Policies should allow individuals to remain in a position for long periods of time. Incentive pays should be provided for key positions and for individuals who demonstrate special skills.

Retain a link between units and fully trained soldiers even when these soldiers leave the unit to enter the IRR. Fully trained soldiers who are unable to continue to participate in unit activities and who still have an obligation remaining can be kept in SRA status or in the IRR with orders returning them to their old unit, if the unit wants to keep them. This assignment can be maintained for a year or so until the soldier returns to his unit, affiliates with a new unit, or his skills attenuate. A change in Inactive National Guard (ING) policies might accomplish the same goal for the ARNG.

3. Provide More Training Time

Reduce the amount of time drilling reservists spend on administration. Increase the number of full time support personnel available to perform administrative tasks, or simplify the tasks themselves. Many key reserve personnel, including commanders, must spend a great amount of time performing administrative tasks.[4] These people could spend their time more effectively in conducting training or participating in training if there were more full time support personnel to perform more of the existing administrative tasks. It may also be possible to reduce the administrative load by simplifying the system itself. For example, the pay system in the Army's reserve components seems to place an unnecessarily heavy burden on unit personnel.

Provide enough full time personnel that units can effectively train full time. Air Force reserve units, for example, have about 30 % full time personnel, including many commanders and/or deputy commanders. This allows them to train their part time pilots and other key personnel continuously and helps to lead to very high readiness. Navy reserve ships are manned at about 60 to 70 % and have a full time commander or

---

[4] One way to reduce the burden of administrative tasks is to decrease their importance relative to success in training.

executive officer. They operate in support of the fleet during the week and train their reserve crew members on weekends.

The ARNG could use more full time support to allow individuals, crews, and small units to train at non-traditional times such as during the week or in the evenings. Small changes, such as providing more support personnel for simulator training, would likely pay big training dividends.

Provide additional training to RC personnel. More peacetime training would reduce the requirement for post-mobilization training. Additional training could be provided for entire units or for key unit members. While it may be difficult and disruptive to demand that entire units conduct more than 39 days of training per year, it is easier for key personnel to train more. Aviation units, for example, provide additional training for their part-time pilots and some key operations and maintenance personnel. Some provisions are already made to provide additional training for armor vehicle crewmen,[5] but the limited number of simulators and trainers prevents the full use of this training time.

New simulators and adequate personnel to support them could significantly enhance the training level of individual crews and platoons. Similar provisions could be made for providing additional training for battle staffs (see Chapter VIII). New personnel might be required to commit to more training time, at least in the first few years of their service when they need to build both their individual and collective skills.

Create new reserve organizations that allow for more training time. A college-based system, for example, could provide the opportunity to give units as many as 60 days of annual training during the summer. This system could be integrated with existing programs, such as the ARNG Dual Membership Program, ROTC, and the Army College Fund. The members of a college-based unit could be ARNG members who are also college students, school or other employees who have their summers free, prior-service soldiers who go to college following their active service, and ROTC cadets and staff. These units could even include special enlistment categories, such as soldiers who train for 1 year on active duty and then remain in a special reserve unit for the following 4 years while they attend college. These units would be designed in ways to reduce turbulence and would obtain about 60 days of intensive field training each year. The type

---

5 Armor crewman are authorized 12 additional 4-hour blocks of training time for training on the Conduct of Fire Trainer.

of soldiers involved and the amount of training provided should mean that such units would be capable of rapid mobilization and deployment.

Implement new training schedules that allow for more effective annual training. There is a consensus that annual training is much more effective than is weekend training. The former Adjutant General of the New York National Guard compared the two by saying, "Annual training is half as long but provides twice the training."[6] For many units, however, the 15 days of annual training provide insufficient time An alternative way to provide more effective training within the same 39 days has been suggested by the commander of the 48th Infantry Brigade. His suggestion is to combine annual training and weekend training. For example, a combination of three 5-day annual training periods with a 2-day weekend training period on each end would provide three 9-day annual training periods. This approach would use all 15 days of annual training and half of the weekend training time. The other half of the weekend training, 24 drills or 12 days, could be spaced over the rest of the year. The major disadvantage of this approach would be that unit members would be required to give up 3 weeks in their regular jobs or with their families rather than the 2 weeks that they normally devote to annual training. On the other hand, they would only be gone from their weekday jobs for a week at a time. This approach would provide the equivalent of 27 days of annual training, or 80 % more annual training per year. It could be a valuable approach for units that have to travel a long way to their equipment and do not have the opportunity to train with their equipment at times other than annual training. At a minimum, units should be given an opportunity to choose this option.

4. Provide More Effective Training

Provide more full time trainers from either the active or reserve components to assist in training reserve units.

- State training organizations can take more responsibility for organizing and running unit training.
- AC personnel could assist in training ARNG units. These AC personnel must be closely enough associated with the unit that they feel a strong sense of responsibility for the unit's performance. They could be advisors to the units and remain in an AC chain of command. They could accept NG appointments and become members of ARNG units with all the rights and

---

6 Interview with Major General Lawrence Flynn on 15 April 1992.

responsibilities that such membership entails (they would continue to hold their federal appointment but could eventually become permanent members of the National Guard or could return to the active component).

Involve Active Component Commanders more directly in RC training by changing the relationships and responsibilities that currently exist in order to strengthen the links between active and reserve units and to give active commanders more responsibility and authority for planning, conducting, and evaluating RC training readiness.

Allow over-strength in higher ranking positions in order to provide some personnel to be involved in training the unit and others to train as part of the unit. For example, a staff officer in a battalion must spread himself between the need to train his unit and the need to train himself. This is more than a part-time soldier can do. An over-strength authorization in the staff would allow for more effective training by providing people to manage the training and people to participate in the training. This provision might have the same impact as increasing the training time for individuals, except that it would be less demanding on the individual and would allow for both types of people to be present simultaneously—the trainer and the trainee.

Provide for CTC time with AC units. Current plans call for assuring the training readiness of RC crews, platoons, and companies in pre-mob and for working on battalion and brigade readiness in post-mob. They also call for AC units to take most of the training time in Combat Training Centers such as the NTC. Many RC units argue that excluding them from the CTCs is uncalled for and unfair. A potential compromise is to send ARNG platoons, companies, and battalions to combat training centers with their affiliated AC units.

Given the difficulty of sending complete units to the NTC, the ARNG might also form provisional units made up primarily of officers and NCOs who would attend the NTC in a special program designed to "train the trainer." For example, an ARNG brigade could form a provisional company team or even a platoon made up primarily of junior officers and NCOs. ARNG officer candidate schools could also send provisional units. These provisional units would receive special training from the Observer Controllers at the NTC. They could employ Ranger School techniques and rotate duties so that all learn what is required at each position and can teach it to their soldiers later. Each NTC

rotation could include a company team or a platoon. In a mobilization this technique could be used to train the leaders of an entire ARNG division simultaneously.[7]

Expand other opportunities for duty with AC units for both part-time and full-time RC soldiers. Provide additional opportunities for part-timers to train with active units. Give priority to training with affiliated AC units. Provide for exchanges of full-time AC and RC personnel among affiliated units. Require full-time support personnel to spend some time with AC units as well as to participate in AC training. Require full-time support personnel to meet the same standards as do active personnel. Provide additional opportunities for RC personnel to participate in CTC training as individuals if it is not possible to participate as units.

Make maximum use of simulator technology in training RC units. Several kinds of simulation are involved. For armored units, for example, conduct of fire trainers can help hone gunnery skills, SIMNET-like virtual simulators can build maneuver and C^3 skills, and JANUS-like constructive simulations can help develop management and coordination skills. These technologies could allow reserve units to squeeze more actual training into the training time available to them. They could also allow for more efficient post-mobilization training when ranges, training areas, and combat training centers will be in full use.

5. Reduce Administrative Impediments to Effective Mobilization

Integrate active and reserve component personnel and logistics information systems. Incompatibilities between active and reserve data systems impose delays beyond those caused by low unit training readiness. Following its mobilization for the Gulf War, the 48th Brigade of the Georgia National Guard suffered many delays due to the effort to convert from the ARNG systems to the active systems. The planned Reserve Component Automation System (RCAS) is not designed to correct this problem and may make it worse.

Provide medical and dental coverage to members of key units. Experience in the Gulf War demonstrated that many reservists were not ready for rapid deployment because of medical and dental problems. Providing such services to key units will help to eliminate this problem and will serve as a key recruiting and retention tool.

---

[7] Col. Lory M. Johnson and LTC Thomas R., Rozman, "Training Reserve Component Units to Standard," *Military Review*, September 1992, pp. 37-47.

6. Train In The Combat Theater

Plan to deploy ARNG units when the strategic lift is available to transport them and conduct final training in the combat theater. No one can predict the circumstances of the next crisis or war for which ARNG units might be needed. While the Gulf War allowed the Army to train its reserve brigades before deploying them, the Marine Corps had a greater need for its reserve infantry and tank units and deployed them before they were fully trained. While training ARNG units fully before deployment is clearly a reasonable goal, a rigid plan to complete all training before deployment may prove unworkable, especially if the strategic lift plan is implemented as currently planned.

U.S. military units often have been deployed to a combat theater or near a combat theater to conduct their final training. In World Wars I and II, U.S. Army forces completed their training in Europe before being committed. In the Korean War, ARNG divisions completed their training in Japan before being committed to the war in Korea. In the planning for the war with the Warsaw Pact in Europe, ARNG units were scheduled to deploy when the lift was available to carry them and the training goal for deployment was a less than fully combat ready. They obviously planned to complete their training in the combat theater.

There is evidence that the ARNG brigades could have completed their training in Saudi Arabia had it been necessary. According to the G3 of the 1st Armored Division,

> If the roundout brigades had deployed to Saudi Arabia after initial post-mobilization training (60 days in CONUS), the range facilities and maneuver space would have been available in the theater of war to enhance their skills. As G3, 1st Armored Division, I was responsible for planning and supporting the live-fire and maneuver training (to include Division-level attack rehearsals) conducted by our units. Our Division's training area was far larger than the Army's National Training Center, and the life-fire and maneuver opportunities exceeded anything available in CONUS or USAREUR. Seventh Corps units, with the direct support of the USAREUR Commander, deployed "Miles" equipment, targetry and ammunition, specifically dedicated to large-scale, multi-echelon training. USAREUR's 7th Army Mobile Training Team organized and supported small unit replacement training in close proximity to VII Corps training areas. Had the decision been made in mid to late January 1991 to deploy the roundout brigades, the trainers and training areas were available. These excellent ranges and maneuver areas had been developed, "proofed" and extensively used by VII Corps units.[8]

---

[8] Strauss, op. cit., p. 29.

Had one or more brigades been in Saudi Arabia when the ground war started, they could have performed a number of secondary missions such as LOC security. They also would have been available to provide unit replacements for units that took large-scale casualties.

D. ESTIMATING THE MAGNITUDE OF POTENTIAL IMPROVEMENTS IN READINESS

1. The Need to Measure Potential Readiness Improvements

The preceding section of this paper listed a number of ways that RC readiness could be improved. Of course, rigorously determining the wisdom of changing organizational structures or management policies for the reserve components in order to improve their readiness requires quantitative insight into how much the changes would improve readiness (and how much they would cost).

2. The State of Current Information

Earlier we showed some apparent correlations between RC training readiness and various factors. It seems quite clear that RC training readiness can be improved, and that it is a function of many policy-related variables, but information on the quantitative relationships between RC readiness and its determinants is sketchy.

There have been some successful attempts to link readiness to training and personnel management policies. For example, research on the AC shows a significant relationship between training experience and NTC performance.[9] Other research has quantitatively tied the readiness of Navy ships to the experience of personnel and the performance of pilots to their training experience.[10,11,12,13] There has, however, been very

---

9 Jack H. Hiller, Howard H. McFann, and Lawrence G. Lehowicz, *Does OPTEMPO Increase Unit Readiness? An Objective Answer*, Army Research Institute, undated.

10 Aline Quester, Russell Beland, and William Milligan, *Ship Material Readiness*, Professional Paper 467, Center for Naval Analyses, March 1989.

11 Stanley A. Horowitz and Allan Sherman, *Crew Characteristics and Ship Condition*, CNA Study 1090, Center for Naval Analyses, March 1977.

12 Colin P. Hammon and Stanley A. Horowitz, *Flying Hours and Aircrew Performance*, Institute for Defense Analyses, P-2379, October 1990.

13 Colin P. Hammon and Stanley A. Horowitz, *Relating Flying Hours to Aircrew Performance: Evidence for Attack and Transport Missions*, Institute for Defense Analyses, P-2609, June 1992.

little quantitative work on the determinants of readiness in the reserve components.[14] Thus, the state of knowledge about improving the readiness of RC units is as follows:

- There is no consistent body of reliable data describing the training readiness of RC units.
- Stated relationships between the level of unit organization and required post-mobilization training time are largely based on judgment (which varies) and administrative determination.
- There are no known estimates of how changes of the kinds discussed above (modifying task requirements, improving the skill of personnel, increasing the amount or effectiveness of training, etc.) would improve training readiness or reduce deployment delays.
- There is agreement among most experts that some combination of these kinds of changes could improve ARNG training readiness and reduce post-mobilization deployment times.

3. Improving the State of Information

Bold Shift, FORSCOM's effort to improve RC readiness, has recognized that consistent measurement of readiness in both the active and reserve components is a critical requirement. Toward this end it has instituted a pilot program of Operational Readiness Exercises (OREs). The goal is to use objective external evaluations to apply uniform standards against which to assess wartime mission preparedness. Reaching this goal requires using performance and not input measures. Most of the current ORE measures involve input measures such as MOSQ% and % fill and do not measure the

---

[14] One unpublished paper in this area is Roberta J. Smith, *Relating Training Readiness to Resource Allocation*, RAND, WD-1472-MRAL, June 1982.

involve input measures such as MOSQ% and % fill and do not measure the ability to do the job. Should effective ORE measures be developed, their routine would allow the Army's leadership to confirm the pre-mob/pre-alert preparedness and operational readiness status of AC and RC units using established training standards.[15] It is worth noting that simulation technology also provides a way to objectively measure some aspects of unit performance in a consistent and reproducible fashion.

If the ORE program is successful, it may provide a basis for analyzing alternative policies in terms of their expected impact on readiness. It may be possible to correlate differences in ORE performance across units—output—with naturally occurring differences in the characteristics of units—input, such as personnel stability, amount of full-time support, proportion of prior-service personnel, training experience, etc. In addition, it may be possible to initiate experimental programs that intentionally vary selected characteristics of units and then to observe the results of the experiments. These kinds of research should permit development of quantitative estimates of how various policy choices are likely to affect the post-mobilization training requirements of reserve component units. Unfortunately, completing this work might take between 5 and 10 years. Analysis of alternative RC training policies could proceed on a shorter schedule.

4. Analysis of Alternative RC Training Programs: the Training-Time-Budget Approach

Because of the paucity of information on how changes in the training programs of ARNG combat maneuver units could reduce their required post-mobilization training time, we developed a logical structure to aid in understanding the possible potential improvements in readiness that might accrue as the result of changes in training policies or techniques. We have called this approach training-time-budget analysis. The basic theory of the analysis includes the following points:

a. Since active units are assumed to be ready to deploy, the peacetime training of active units provides a benchmark against which to assess RC training programs.

b. If a reserve unit can perform the training activities specified for a comparable active unit, it is also ready to deploy.

---

[15] FORSCOM Operational Readiness Exercise (Pilot Program), Headquarters Forces Command, February 1992.

c. To the extent it cannot perform all those activities, it has a training deficit which can be measured by the number of days that the unperformed training events take active units to perform.

d. Alternative RC training strategies can be evaluated in terms of their impact on the training deficit.

e. It is possible to link the peacetime training deficit to the amount of post-mobilization training time required prior to deployment. This methodology focuses on the amount of training time available to RC units (their training-time-budgets) and considers what training events they can accomplish within those budgets.

We will apply this theory to ARNG heavy units. The purpose of the analysis is to better understand how greater use of virtual and constructive simulation in the training of RC combat units might be able to improve their readiness. Throughout the analysis it is important to bear in mind the uncertainties involved, particularly uncertainties about how much more productively simulation allows RC units to use their limited training time. Quantitative estimates of post-mobilization times under several sets of explicit assumptions are derived. We can only be as sure of the precision of the estimates as we are of the assumptions. The idea of the analysis is to demonstrate potentials, not to identify proven possibilities. The main steps in the analysis are:

a. Determine the training that must be performed by a unit to meet Army standards for a unit's Mission Essential Task List (METL).

b. Estimate how much training is needed to reach the performance standard. This requires consideration of the extent to which different echelons must train together and the extent to which they can perform different training activities in parallel. This will permit quantification of the ability of RC units to accomplish the required training at all echelons.

c. Calculate the RC training deficit by comparing the estimate of training time with the training time that is available to RC units. For ARNG armor units, we make separate calculations of the peacetime training deficits for gunnery training, maneuver training through the company level, and maneuver training at the battalion and brigade levels.

d. Estimate the extent to which the deficit could be reduced by greater use of simulation in both peacetime and post-mobilization training. These techniques should permit more training activity to take place per training day because they allow units to avoid moving and preparing equipment, and to train more effectively in a dispersed environment. The uncertainty concerns the magnitude of these improvements.

e. Estimate how much reduction in the peacetime training deficit would reduce required post-mobilization time.

E. THE EFFECT OF GREATER USE OF SIMULATIONS ON THE TRAINING READINESS OF NATIONAL GUARD GROUND COMBAT UNITS

Simulation can improve the training readiness of heavy units in several ways. Individual and crew-related gunnery skills can be enhanced using a range of training aids and devices. These include the Videodisc Interactive Gunnery Simulator (VIGS), the arcade-like Top Gun device, Conduct-of-Fire Trainers (COFTs), Guard Unit Armory Device Full-Crew Interactive Simulation Trainer (GUARD FIST), and the Hand-Held Tutor.[16] Virtual simulations like SIMNET or its follow-on, the Close Combat Tactical Trainer (CCTT), can train maneuver and command and control tasks that range from the crew level to the battalion level. They can also train gunnery skills to some extent. Constructive simulations like JANUS are most useful at the battalion, brigade and division levels and can be used to train planning and synchronization tasks. Chapter VIII outlines a new approach to using JANUS and SIMNET together in a distributed simulation network designed to train ARNG battalion and higher units in their synchronization tasks.

As was noted above, to better understand some of implications of possible states of the world regarding how much and how productively simulation of various sorts could be effectively used to train RC combat units, our application of the training-time-budget methodology examines three alternative cases. The cases vary with respect to the extent and type of simulator use hypothesized for ARNG heavy brigades.

In all of the cases to be examined, we make the following assumptions:

- An AC heavy brigade performs roughly 68 days per year of gunnery training. This estimate is based on preliminary examination of unit training plans for five units, by researchers at the RAND Corporation.[17]
- An AC heavy brigade requires 39 days of platoon and company maneuver/coordination training and 32 days of battalion maneuver/coordination training. These numbers come from the Fort Knox analysis. Two-thirds of

---

16 The use of these aids and devices is discussed in John E. Morrison, David A. Campshure, and Earl L. Doyle, *A Device/Aid-Based Strategy for Training M1 Tank Gunnery in the Army National Guard*, Human Resources Research Organization, April 1991.

17 As yet unpublished research by Thomas F. Lippiatt, J. Michael Polich and Ronald E. Sortor, RAND.

these 71 days are spent in activities that can at least partially be trained in SIMNET.

- An RC heavy unit is authorized six days of simulator time for gunnery training for M-1 and M-2 crews beyond the 39 days of participation required of reservists.
- Of the 39 days per year of required participation, only 23 are used to perform training activities, 12 days on weekends and 11 days at annual training. The rest of the time is taken up with administration.
- Half of these 23 days are devoted to individual and crew-level gunnery training. The rest are devoted to maneuver training.
- Training performed in simulators of all kinds (gunnery simulators like COFT, SIMNET/CCTT, and constructive simulation) allows three times as much trainee achievement per unit time than would otherwise be possible.

This last assumption deserves further attention. The relative value of simulator training and non-simulator training is a critical factor in estimating how much additional simulator use could reduce the peacetime training deficit. As has been noted, there is no precise information on the value of this factor. The ratio of 3:1 was developed in discussions with individuals involved in armor training in both the active and reserve components. It is a subjective estimate, and is definitely not proven to be correct. In addition, this ratio can be expected to vary across training activities, but we are seeking a reasonable rule of thumb.

The precise value of the ratio aside, the notion that simulation is a valuable aid to training effective armor units rests on two observations. First, the accomplishment of training in the field is limited by the friction of field operations. The amount of time it takes to make equipment ready to use, get to and from the training area, and (in the case of staff training) to wait for feedback from organizations or personnel working in (or near) real time. Of course, the relative effectiveness of field training and simulator training varies widely. Some things are best taught in the field and some are best taught using simulation. Our assumption is really that simulation permits the hypothesized compression of training time over the range of simulation use we examine.

Our second observation is that there is quantitative evidence that greater use of simulation improves the performance of armor units. The U.S. Army Armor and Engineering Board executed an experiment where it generated a control group and an experimental group of tank platoons, gave them a pre-test to determine their competence, trained the experimental group on SIMNET and the control group through standard field

training for six days, and then tested the groups after the training.[18, 19] The groups were scored "Go" or "No Go" on a series of tasks within the given exercises. The platoons with SIMNET training raised their Go percentages by 11 percentage points, while the platoons with field training only raised theirs 6 percentage points. The difference between these results is statistically significant.

Ongoing research by the Army Research Institute (ARI) seems to indicate that prior COFT usage is reflected in better gunnery performance at the National Training Center. In addition, a review of the gunnery training process in the ARNG performed for ARI has recommended greater reliance on training devices.[20] A revised training strategy was developed and is now being tested. There is persuasive evidence that more use of simulation would improve the readiness of ARNG armor units; the uncertainty revolves around the magnitude of the improvement: how much more training can be accomplished in a fixed period of time.

The assumptions listed above allow us to estimate variations in the peacetime training deficits faced by ARNG tank brigades in the cases to be examined. In order to estimate the effect of these variations on post-mobilization times, we make the following assumptions about post-mobilization training:

- An RC heavy brigade that receives peacetime training without increased emphasis on simulation would need between 79 and 128 days of post-mobilization training before being ready to deploy. This range is taken from the preliminary RAND analysis.[21] The Army's official estimate of 90 days is within this range. The 79 day estimate is based on the Army Inspector General's review of the Gulf War call-up experience, supplemented by the assumption that recommendations designed to improve RC readiness will be adopted and have the desired effect.[22] The 128 day estimate was developed by RAND, based on the possibility that it may be difficult to improve RC readiness. We draw on RAND's work to break required post-mobilization

---

18 D. Gound, and J. Schwab, "Concept Evaluation Program of Simulation Networking (SIMNET), Final Report," TRADOC TRMS No. 86-CEP, U.S. Army Armor and Engineering Board, Fort Knox, Kentucky, March 1988.

19 This discussion also draws on Orlansky, J. and J. Thorpe. "SIMNET - an Engagement Training System for Tactical Warfare," *Journal of Defense Research*, Vol 20, No 20, February 1991 and on Angier, B. N., E. A. Alluisi and S. A. Horowitz, "SIMNET and Advanced Training," IDA P-2672, 1992.

20 See Morrison, Campshure, and Doyle, op. cit.

21 Lippiatt, Polich and Sortor, op. cit.

training time into time devoted to gunnery training, time devoted to maneuver training at the platoon and company levels, and time devoted to maneuver training at the battalion and brigade levels.

- Some post-mobilization time is needed for mobilization, movement, maintenance, recovery, and preparation for loading, and cannot be reduced by greater use of simulation.
- Some post-mobilization training time may not be amenable to reduction, regardless of the readiness of the mobilized units. Some validation is required before deploying National Guard combat units. We have assumed that the time required for this is one week of gunnery training, one-quarter of the otherwise necessary amount of platoon/company maneuver training, and one-half of the otherwise necessary amount of battalion/brigade training. Experience in using simulation to evaluate training readiness in peacetime may ultimately allow for validation of some tasks in simulation.
- The amount that the variable portion of post-mobilization time can be reduced is directly proportional to a reduction in the peacetime training deficit for a given kind of training (gunnery, platoon/company maneuver, or battalion/brigade). For example, suppose there is a 27 day peacetime training deficit for platoon and company maneuver training and 30 days of post-mobilization time would now have to be devoted to this kind of training, 24 of which are amenable to reduction. The 3:1 rule says that shifting 3 days of peacetime training in this area to simulation would cut 6 days from the peacetime training deficit, a 22 % reduction. The variable portion of required post-mobilization time would be reduced by the same 22 %, from 24 to 19 days. The assumption of proportionality is consistent with the belief that completely eliminating the peacetime training deficit would render an RC unit as ready as an AC unit.
- The 3:1 rule also applies to the use of simulators in post-mobilization training.

The reason it is necessary to make these assumptions is uncertainty about four things: the readiness of active units, the readiness of reserve units, the effectiveness of field training relative to simulator-based training, and the sensitivity of required post-mobilization time to the readiness of units. Without better information, the only way to

---

22 Department of the Army Inspector General "Special Assessment: National Guard Brigades' Mobilization," June 1991.

analyze alternative training policies is to investigate the implications of particular hypotheses and assumptions.

We describe below three cases that examine ways in which simulation could play a larger role in the training of National Guard heavy brigades. In the first case, simulation is used extensively for peacetime gunnery and platoon/company maneuver training. The second case adds simulator time during post-mobilization training. The final case investigates the implications of using constructive simulation for battalion/brigade level maneuver training during peacetime.

Table VII-2 summarizes the results of analyzing the first case. We assume that simulation will be used for all weekend training and half of AT maneuver training. This adds 14.75 extra days of simulator use per year. It could reduce the training deficit for gunnery from 38.5 days to 26.5 days and the peacetime training deficit for platoon/company maneuver training from 27.5 days to 10 days. Our assumption that reducing the peacetime training deficit leads to a proportionate decrease in required post-mobilization training time (excluding fixed portions of post-mobilization time) allows us to estimate that the amount of post-mobilization training required could fall by between 16 and 30 days.

Table VII-2. Case 1: Greater Peacetime Use of Simulation in National Guard Heavy Units Through Company Level

	Gunnery	Pltn./Co. Maneuver	Bn./Bde. Maneuver	Total
Active Units Plan	68	39	32	139
Guard Currently Has:				
weekend (simulator days)	6	0	0	6
weekend (other)	6	6	0	12
annual training	5.50	5.50	0	11
Peacetime Training Deficit	38.50	27.50	32.00	98
Potential Additional Simulator Use:				
weekend	6	6	0	12
annual training	0	2.75	0	2.75
Potential Peacetime Deficit	26.50	10.00	32.00	68.50
Percent Reduction	31	64	0	30
RAND Estimate of Post-Mob. Time				
minimum	23	24	14	79
maximum	39	41	19	128
Amount of Post-Mob Time Not Amenable to Reduction				
minimum	7	6	7	38
maximum	7	10	10	56
Potential Post-Mob Time:				
minimum	18	13	14	63
maximum	29	21	19	98

Table VII-3 illustrates Case 2, which takes the perspective that simulators can help the post-mobilization training of RC tank units as well as peacetime training. The assumption is that one-quarter RAND's estimate of potential post-mob time for gunnery and platoon/company maneuver training identified in Table VII-2 as amenable to reduction could be given over to simulator-based training.

Table VII-3. Case 2: Greater Peacetime Use of Simulation in National Guard Heavy Units Through Company Level and Use of Simulation During Post-Mobilization Training

	Gunnery	Pltn./Co. Maneuver	Bn./Bde. Maneuver	Total
Active Units Plan	68	39	32	139
Guard Currently Has:				
weekend (simulator days)	6	0	0	6
weekend (other)	6	6	0	12
annual training	5.50	5.50	0	11
Peacetime Training Deficit	38.50	27.50	32.00	98
Potential Additional Simulator Use:				
weekend	6	6	0	12
annual training	0	2.75	0	2.75
Potential Peacetime Deficit	26.50	10.00	32.00	68.50
Per Cent Reduction	31	64	0	30
RAND Estimate of Post-Mob. Time				
minimum	23	24	14	79
maximum	39	41	19	128
Amount of Post-Mob Time Not Amenable to Reduction				
minimum	7	6	7	38
maximum	7	10	10	56
Additional Post-Mob Simulator Time				
minimum	2.75	1.64	0	4.39
maximum	5.51	2.82	0	8.32
Potential Post-Mob Time:				
minimum	13	9	14	54
maximum	18	16	19	82

We estimate that this post-mobilization use of simulation could reduce post-mobilization time an additional 9 to 16 days.

Finally, Case 3, illustrated in Table VII-4, incorporates additional peacetime simulation training in the area of battalion and brigade maneuver training. This is meant to address the perceived deficiencies of leadership training in National Guard combat units. The idea is to facilitate command post exercises and improve the synchronization skills of leaders. We assume that this training does not conflict with training through the company level, but that it reduces the amount of time spent honing higher-level synchronization skills in post-mobilization training. In the example, five days of

peacetime simulation training are provided for teaching battalion- and brigade-level maneuver skills.

Table VII-4. Case 3: Greater Peacetime Use of Simulation in National Guard Heavy Units Through Brigade Level and Use of Simulation During Post-Mobilization Training

	Gunnery	Pltn./Co. Maneuver	Bn./Bde. Maneuver	Total
Active Units Plan	68	39	32	139
Guard Currently Has:				
weekend (simulator days)	6	0	0	6
weekend (other)	6	6	0	12
annual training	5.50	5.50	0	11
Peacetime Training Deficit	38.50	27.50	32.00	98
Potential Additional Simulator Use:				
weekend	6	6	5	12
annual training	0	2.75	0	2.75
Potential Peacetime Deficit	26.50	10.00	17.00	53.5
Per Cent Reduction	31	64	47	45
RAND Estimate of Post-Mob. Time				
minimum	23	24	14	79
maximum	39	41	19	128
Amount of Post-Mob Time Not Amenable to Reduction				
minimum	7	6	7	38
maximum	7	10	10	56
Additional Post-Mob Simulator Time				
minimum	2.75	1.64	0	4.39
maximum	5.51	2.82	0	8.32
Potential Post-Mob Time:				
minimum	13	9	11	51
maximum	18	16	15	77

The additional simulator training is estimated to have the potential to reduce the peacetime training deficit for battalion/brigade maneuver training by 15 days, or 47%, and to reduce post-mobilization time an additional 3 to 4 days.

Table VII-5 summarizes the results of our analyses of the possible implications of providing more simulator-based training to National Guard heavy units.

Table VII-5. Potential Post-Mobilization Times Under Alternative Cases

	Minimum	Maximum
Baseline Post-Mobilization Training Times	79	128
Case 1: More Peacetime Simulation Through Company Level	63	98
Case 2: Adds Post-Mobilization Use of Simulation	54	82
Case 3: Adds Peacetime Simulation for Battalion/Brigade	51	77

Case 1 implies a reduction in post-mobilization time of 20 to 23 %, Case 2 32 to 36 %, and Case 3, 35 to 40%. Although these estimates are imprecise, the opportunity for improvement may be substantial.

Additional cases could be constructed to look at additional training alternatives or to relax some of the assumptions we have made. Among the uncertainties that further research might resolve or that additional cases might illuminate are the following points:

- The post-mobilization deficit described in this report does not make adjustments for the possibility of simultaneous training. If, for example, platoons and companies can conduct gunnery training simultaneously with battalions and brigades conducting maneuver training, the post-mobilization time can be reduced.
- The calculation of the peacetime training deficit assumes that the RC conducts its training at the same intensity as the AC. If the RC training proves to be conducted at a more intense rate, the peacetime training deficit might be reduced.
- The cases investigated above do not give the AC credit for the simulation training they currently conduct. Applying the 3:1 rule to this training will increase the peacetime training deficit.
- The relationship between AC and RC training may prove to be different from that assumed here. For example, experience may find that the RC does not need to conduct the same training events as the AC in order to meet METL standards. This could reduce both the peacetime training deficit and post-mobilization training time.
- Assumptions regarding the portions of peacetime and post-mobilization training amenable to reduction via simulation may prove to be too ambitious.

- Given the shortage of field training sites for both gunnery and maneuver post-mobilization training, the use of simulator training may allow for simultaneous training of multiple units and thereby reduce overall ARNG post-mobilization time.

F. ADDITIONAL CONSIDERATIONS ABOUT GREATER USE OF SIMULATION FOR TRAINING NATIONAL GUARD COMBAT UNITS

Under the assumptions we have made, it looks as if greater use of simulation could lead to significant improvements in ARNG training readiness and to reductions in their post-mobilization time. Two cautions about this result should be borne in mind:

- There is great uncertainty about the degree to which simulator use allows more training to be accomplished in a given period of time. The estimates presented here indicate possibilities, but they do not conclusively show how much improvement is possible. We do not know enough about the implications for training readiness of different mixes of live training, virtual simulation, and constructive simulation. More work needs to be done to pin this down.
- Greater use of simulation implies additional cost. Training aids and devices must be bought, and they must be kept available. A strength of simulation is that it can be used on short notice at all hours; this only helps if facilities are open and if equipment is operable.[23] Guard heavy units have reported difficulties keeping COFTs operable. Overcoming this problem would probably require additional full-time personnel to oversee training and to perform maintenance.

Another, more upbeat, point also deserves mention:

> There is substantial attention being paid today to the use of advancing technology to tie together field and simulator training at all echelons of the force structure. The Defense Advanced Research Projects Agency (DARPA) and the ARNG are conducting a multi-year test to determine the potential for simulation to improve ARNG training readiness. We believe the analysis offered here presents an approach for measuring the gains in training readiness that simulation can bring.

---

[23] Personnel at the 48th Brigade of the Georgia National Guard have made this point to us.

G. CONCLUSIONS AND RECOMMENDATIONS

1. Conclusions

a. There are substantial variations in the readiness of RC units. Some RC combat service support units are virtually as ready to deploy as are corresponding active units. Some Army RC units have been pre-validated to deploy.

b. The training readiness of RC units and their post-mobilization deployment times are associated with factors that can be influenced through management policy. In particular, training readiness can be improved by improving personnel skill levels, by limiting or tailoring the scope of the mission assigned to RC units, and by increasing the amount and effectiveness of training received by the units. The length of time it takes RC units to be able to deploy is also influenced by administrative impediments, such as the incompatibility of reserve and active personnel and logistics information systems.

c. The impact on training readiness (as measured by required post-mobilization train-up time before deployment) of policy changes in these areas cannot be measured or estimated very precisely, largely because of the absence of reliable information on the state of readiness. This is as true in the active component (whose units are assumed to be ready) as it is in the reserve components.

d. It is possible to use the performance of required training events to develop an estimate of the impact of changes in training programs on the readiness of RC units. We have termed this the training-time-budget methodology.

e. A very preliminary application of the training-time-budget methodology indicates that it may be possible to reduce the required post-mobilization train-up time of a National Guard armor brigade by 20 to 40 % from its currently estimated range of between 79 and 128 days. Because of uncertainty about the assumptions behind this estimate of improved training readiness, this result should be taken as demonstrating great promise rather than documenting the proven potential of simulation.

f. Further reductions in required post-mobilization training times are possible for RC combat brigades. This conclusion is warranted because our quantitative analysis has been conservative by not incorporating estimates of the impact of many potential ways of improving reserve readiness. Incorporation of even a few of the changes suggested in this Chapter, Section D, would likely improve RC training readiness.

2. Recommendations

a. Continue the ARNG/DARPA test program. Consider expanding the program to make existing simulator technology more available to some reserve component combat units in the near future. The program should cover gunnery simulation, SIMNET-like simulation and constructive simulation. We cannot be certain how much this will affect reserve readiness, but it should yield substantial improvements. Evaluation of near-term experiments would also help guide future RC training policy decisions (and active/reserve force mix decisions) by providing better information on how much training readiness could be improved.

b. Apply the training-time-budget methodology to different kinds of RC units. Determine whether the variations in the training deficit are consistent with our understanding of variations in required post-mobilization training time

c. Institute a program to measure the required post-mobilization train-up time of RC combat units, and to estimate its dependence on policy-related factors. Active component units should be included to provide a point of comparison. There is great uncertainty in this area, and it is absolutely critical to the development of appropriate RC management policies and the selection of a cost-effective active/reserve mix. The program could focus on performance at Combat Training Centers, such as NTC. Operational Readiness Exercise results may be an acceptable substitute for CTC performance. By providing an opportunity for a standardized environment, simulation also could be a source of performance information. However performance is measured, it will also be necessary to link performance shortfalls to estimates of the post-mobilization train-up time needed to correct them.

d. Estimate how changes in post-mobilization train-up time would influence the cost-effective active/reserve mix under alternative scenarios. This would tell us how much we would have to improve RC readiness for it to make a difference, and would allow us to judge the importance of using innovative RC training technologies.

VIII. NEW APPROACHES TO USING SIMULATION FOR TRAINING

This chapter describes a new approach to using virtual and constructive simulation for training ARNG combat maneuver units in many of their key synchronization tasks. We have called this training system STXSIM for Situational Training Exercise, Simulation. We have attempted to design it to address some of the training problems that we have identified in the process of conducting this study. We have also designed it in light of other work under way at IDA to develop a method for training ARNG battle staffs at the battalion and brigade level.[1] Finally, we have designed it to be consistent with Army training doctrine.

A. BACKGROUND

Virtual and constructive simulation have been extensively used in recent years for training in all of the military Services. Simulators have been used successfully in training individuals and crews. In the Army, the Conduct of Fire Trainer (COFT) is key to training gunnery in both M-1 and M-2 crews. The Army also is engaged in a major effort to expand on the successful development of SIMNET simulators for training crews and platoons. This new system of simulator training is called the Close Combat Tactical Trainer (CCTT) and may also be used to train leaders at the company and battalion level.

One area of combat operations that both active and reserve units find difficult is in the synchronization of commanders and staffs in their use of Battlefield Operating Systems (BOS) that are critical to success on the battlefield. This problem appears at both the battalion and brigade staff level. The Army has developed a successful method of training commanders and battle staffs in their synchronization responsibilities at the Tactical Commander's Development Course (TCDC). Part of this training is conducted using constructive simulation, to include the use of the Janus combat model. This chapter reflects our understanding of the problems the three ARNG brigades that were mobilized for the Gulf War had in performing their synchronization tasks during their post

---

1 LTG J. F. Brown (Ret.), *Battle Command Staff Training*, IDA Report, forthcoming.

mobilization training. It describes our conceptual design of a way to train Reserve Component battalion and brigade commanders and their battle staffs in their key synchronization tasks by using Janus and SIMNET in a distributed simulation network.

B. GOALS

We chose the following goals to guide us in the conceptual design of the Distributed Simulation Network for training. .

1. **The distributed simulation system should provide ways to improve training and combat readiness of Army National Guard ground combat units.**

   To reach this goal we felt the system should:

   - Be capable of near-term operation for at least two ARNG brigades.
   - Have a multi-echelon capability that can link ARNG crews, platoons, companies, and battalions with their parent brigade and division and can link all echelons with their associated active component unit.
   - Provide the capability for making an objective assessment of training readiness that will be meaningful to both the active and reserve components.
   - Provide a capability for training "at home" as well as at the armory.
   - Be capable of both fully integrated and independent use of virtual and constructive operation.
   - Allow for use of existing doctrine and for the development of new approaches to doctrine.
   - Be adequate for both pre-mobilization and post-mobilization training and, if possible, be capable of being deployed overseas so that the ARNG can continue to use it to train itself and to train with the associated active component unit.

2. **The distributed simulation system should provide a seamless integration of virtual and constructive simulation and allow for the training of individuals, individual unit battle staffs, and integrated units up to corps level.**

   To reach this goal we felt the system should:

   - Allow for the simulation of the operation of all seven Battlefield Operating Systems.
   - Operate in real time or faster than real time, and allow for the training of a full range of synchronization and timing skills.

- Be capable of changing as doctrine changes, and be adaptable to lessons learned.
- Use existing simulation and communication systems as much as possible. Only minor modifications to these systems would be acceptable.

C. THE CONCEPT

In order to meet these goals we attempted to design a flexible system that would allow for a wide variety of training alternatives:

- Train a single individual on a specific job in a tank or in operating a Battlefield Operating System.
- Train entire crews, platoons, companies in tactical operations.
- Train unit battle staffs on one or more BOS.
- Train multiple echelons in their synchronization tasks.

This training could be conducted in either virtual or constructive simulation or in a combination of both types of simulation. It should allow for training in action skills such as performing tactical movements (a skill best trained in virtual simulation). It should allow for training in synchronization and planning skills such as planning an offensive or a resupply operation (a skill best trained in constructive simulation). And it should allow for training in skills that combine action with synchronization and planning skills, such as conducting a combat action in which, for example, the battalion commander might maneuver his battalion in virtual simulation while the battalion staff plans the continuing battle in constructive simulation. Our main focus in designing this system was that it should allow for training commanders and staffs in the critical synchronization and timing skills in which the ARNG has been found wanting.[2]

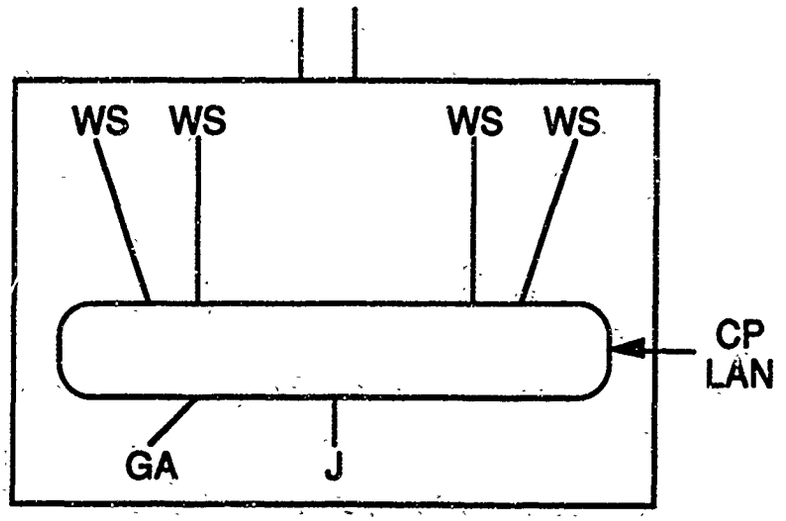
Battalion Training

In its most basic form, the system would operate as a command post local area network (CP LAN). Figure VIII-I shows the elements of a CP LAN for a battalion command post. The Janus model would provide the combat interactions of individual systems for each of the companies under the battalion. Some modifications to the existing Janus model would be needed to allow operation on the network; however, it will

---

2 Department of the Army Inspector General, op cit.

be possible to have the changes "switchable" in and out so that the new version is completely compatible with standard non-network operation.



WS - CP work station
J - Janus
GA - Guard Agent

Figure VIII-I. Battalion STXSIM Configuration

The key concept of STXSIM is the use of the guard agent (GA) on the CP LAN. The GA would be separate hardware and software on the network. It would provide the interface between the command post staff and the Janus model. GA would take its directions from the battalion commander and the staff officers (plans, OPORDs, FRAGOs, etc.) and translate them into Janus scenario-specific parameters. The GA would also translate Janus events from obscure computer data into the sitreps, spot reports, casualty reports, etc., that would normally originate in subordinate companies. The GA would then direct these combat reports to the appropriate CP LAN work stations (S2, etc.) for use by the commander and staff. In essence, the GA would be responsible for performing most of the functions that humans perform today when Janus is used in training tactical commanders. GA would also maintain a history file of all appropriate data for use during After Action Reviews and restart of Janus.

The CP LAN work stations would simulate the normal staff work stations in the field. They would provide access to the message traffic from the GA and would allow

review of unit status data via menus and forms tailored for each position. The combination of the function-specific work stations (e.g., fire control, logistics) and the interpretation of message traffic by GA would allow implementation of all seven BOS and would provide for their impact on the combat in Janus. Each work station also would have the capability of being in a combat display mode that replaces the acetate covered map. This display could include all control measures and shows the known position of forces on both sides, as reported by the staff process. These work stations could be designed as part of the Army Maneuver Control system or to simulate that system.

A variation of the C^3 Methodology code developed for the JCS is envisioned as the basis for the GA agent between the NG NET and Janus. It would convert the Janus data into reports and orders that can be used by the participants, and vice versa. This agent would provide work station access at each CP to interactive forms such as plans, OPORDS, FRAGs, and requests for support. It also would interpret combat orders into Janus input to respond to combat decisions made by a man-in-the-loop at its higher headquarters. These orders may establish unit movement, unit resupply, initiate mortar/artillery fire, or commit helicopter support. The agent also would model communications impacts (capacity, reliability, priority traffic, direct attack, electronic warfare) on its message traffic. After action review data would be stored by the agent and Janus and accessed via the agent.

Other important characteristics of STXSIM include:

- Man-in-the-loop at work stations at every echelon that is participating in the exercise. Command Post staff would use network work stations to initiate combat plans, issue operations orders (OPORDs), fragmentary orders (FRAGs), requests for support and combat reports.
- Perceptions of combat engagements would be based on situation and status reports that are received at a command post and not on the unrealistic availability of combat data generated as simulation "truth."
- Measures of performance and measures of effectiveness could be available to assist after action reviews, to augment the simulation rerun capability and, potentially, to provide a capability for evaluation and even validation for deployment.
- Could be designed for use at any echelon, from company through corps.
- Could have a dial-up capability that would allow use of the simulation without being in the armory. This would allow each staff person or the commander to practice their function by phone from home. It would allow

practice by the complete staff including interactions with other staff, functions.

- It would allow for engagement against a reactive foe.

2. Brigade Training

Figure VIII-2 shows the configuration of STXSIM for a brigade simulation. Each battalion command post would be connected to the brigade-wide area dial-up network (NG NET on the figure) via the GA. This would be an additional capability of that agent's software and hardware. Message traffic created by the battalion's work stations would be routed throughout the NG NET via the GA. Operations orders created at work stations in the brigade would be put onto the NG NET by the GA at the brigade. The function of the network elements at brigade level would be similar to those at battalion level.

3. Battalion/Brigade Training with SIMNET

While the basic STXSIM would use Janus and the GA operating on the CP LAN and the NG NET, we believe it is also possible to create a seamless melding of Janus with SIMNET, a virtual simulation. Figure VIII-3 shows a variation of STXSIM in which battalion and brigade command posts are connected to a SIMNET network via a SIMNET Agent (SA). The network should be flexible enough to allow the entire brigade or any combination of its sub-units to train on it, as necessary. The SA, like the Guard Agent, would be independent hardware and software on the CP LAN; it would serve to interface Janus and SIMNET. The melding of Janus and SIMNET would require that:

- SIMNET data be interpreted into a form understandable to Janus, and vice versa.
- Janus and SIMNET match model times.
- Line of Sight discrepancies between the two models be resolved.

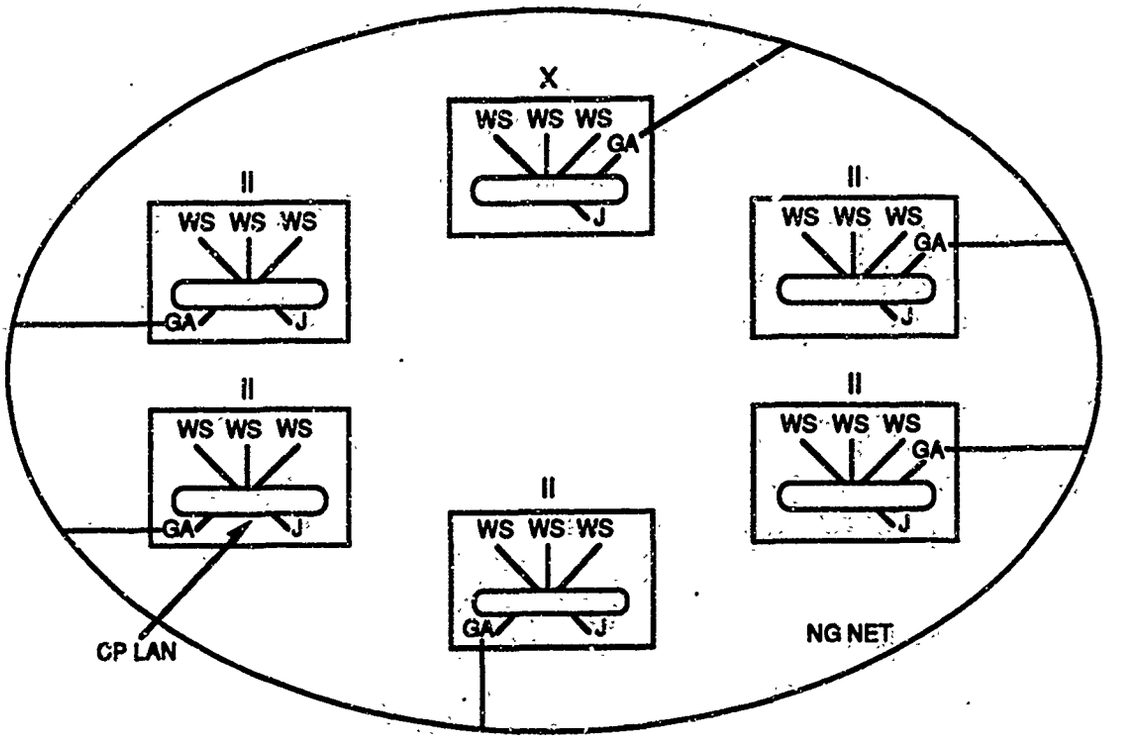


Figure VIII-2. Brigade STXSIM Configuration

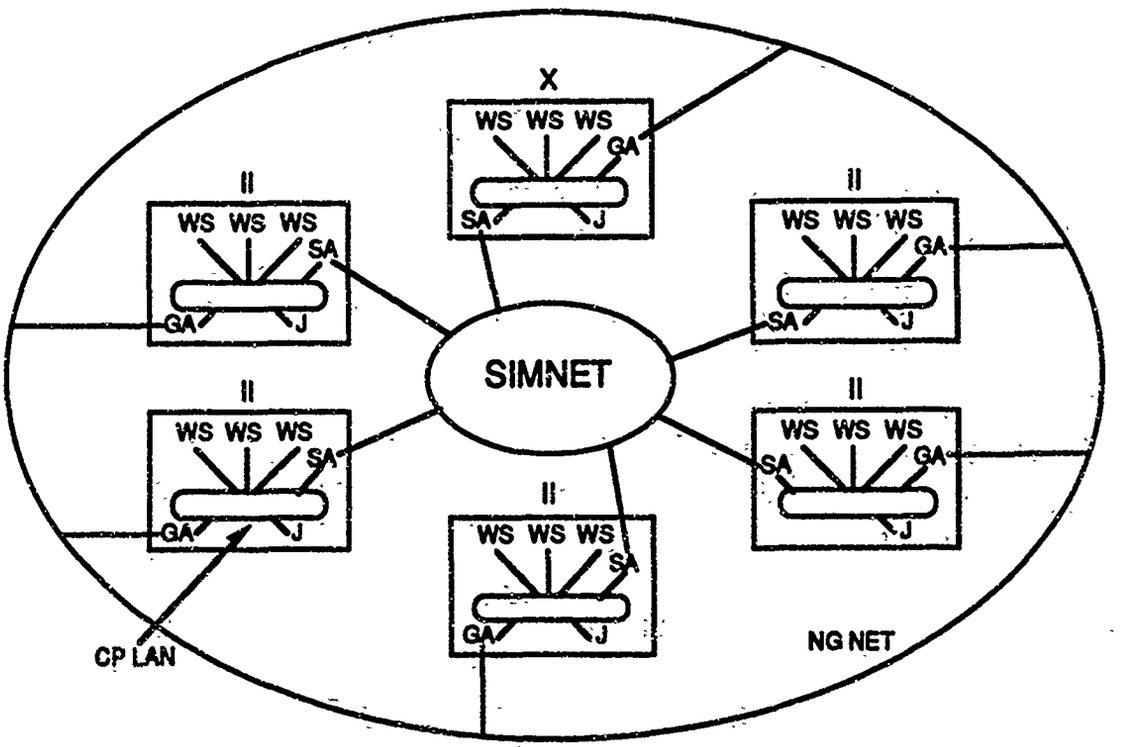


Figure VIII-3. Brigade STXSIM Configuration Using SIMNET

No modification to SIMNET would be required for full integration of the virtual and constructive simulations. The SIMNET systems (simulators) would be included in all Janus calculations and shown on the Janus combat display. Janus would not make these systems fire their weapons nor would it calculate the results of systems being fired upon. These functions would be done on SIMNET. Janus, via the SA, would get the "SIMNET system firing at a Janus vehicle" data from SIMNET and evaluate the results of the firing event on the Janus entity. Conversely, Janus entities that fire at SIMNET systems would create firing data for evaluation of the shots on SIMNET.

The SIMNET "magic carpet" could be used by the battalion or brigade commander/staff to get a three dimension look at the combat forces on the Janus systems. This view would be helpful in monitoring combat maneuvers and applications of tactics. If sufficient SIMNET simulators are available, a company-size task force that is responsible for a key role in the brigade's plan could be simulated by soldiers in SIMNET simulators.

Alternatively, SIMNET could be used to enhance the commander's view of combat by having him operate from a SIMNET simulator. Company, battalion and brigade commanders could direct their unit, represented in Janus, while observing/participating in the combat of their subordinate units from a SIMNET simulator. This would be intended to give them a "feel" for the combat situation and the timing of combat maneuvers. It would also allow the staffs to practice supporting the operation while the commander is in the field in a combat vehicle. The SIMNET network would also allow ARNG units to participate in SIMNET-based STXs with the AC.

D. TRAINING USING STXSIM

STXSIM would provide the capability for repetitive training to standard in the use of C^3 systems and in the use of combat systems (Battlefield Operating Systems) for commanders and staffs. This training could be conducted at single or multiple echelons; it could be via the constructive simulation by Janus alone or by Janus and the virtual simulators on SIMNET. Commanders could operate from computer work stations or from SIMNET vehicles. Staff officers would operate from computer work stations that could be configured for each staff position in a command post. The staff officer would be able to participate in the command and control of the simulated combat on the Janus

computers from the STXSIM work station using battle map graphics, a menu of commands, combat reports and unit status summaries.[3]

The description of STXSIM above explains the basic concept of the system, but it is not complete. There are a number of additional steps that must be taken before it can be used for training:

- The specific tasks to be trained must be determined. Responsible officials must decide which tasks need to be trained.
- Measures of Performance and Measures of Effectiveness must be identified.
- Tactical tables and situational training exercises to teach those tasks must be created and the Measures of Performance and Measures of Effectiveness must be built in.

Although unrelated to this study, the ongoing IDA study *Battle Command Staff Training* is designed to accomplish these three goals for the ARNG. We have used many of the insights developed in *Battle Command Staff Training* as a basis for designing STXSIM.

Training in STXSIM using fixed tactical tables similar to gunnery tables, with objective measures of performance and effectiveness, would allow for the objective evaluation of the performance of ARNG units to standard. By providing tactical engagement simulations for battle staffs, this concept has the potential for significantly increasing the combat effectiveness and training readiness of ARNG battle staffs.

1. Single Staff Member Training

A single staff member can use STXSIM at his home or at the armory. In either case, the training can start with a briefing on the combat situation. This briefing might be on video tape so that the staff member could review it carefully. The staff member would connect the PC work station to the command post's network and initiate STXSIM. The data and forms necessary for each staff member to perform his job could be available on a PC in his home. Some situation displays also could be available. For example, the S-4

---

[3] Graphics provides color views of the combat terrain annotated specifically for a staff function. The menu provides access to automated forms for OPORDs, FRAGOs etc. The reports that would be available on the work station are the operational reports that the staff function would receive, including losses, SITREPs, and intelligence reports from subordinates and orders/messages from superiors. Data from the reports will be used to automatically update the perceptions of combat unit/foe status on the work station. Status summaries also will be available at the work station.

might receive all the reports on the PC that normally would be received from both higher and lower units (e.g., supply status reports, emergency supply requisitions, logistic trains' locations). Supply actions required could include redirection of trains to alternate LRPs, modification of the schedule for resupply of subordinates, review of use rates, selection of cache or "tail gate" resupply technique, etc. Such an initial exercise might cover 24 hours of combat and logistics operations in 2 clock-hours. At the end of the session, the staff officer might conduct his own After Action Review and compare his performance with the performance of a skilled staff officer performing the same duties.

2. Battalion Staff Training

Battalion level training would normally be conducted at the armory because of the importance of getting commanders and staff officers to develop the key synchronization skills. Some training could be conducted with staff officers at home, however.

During the exercise, each staff work station would receive all the standard reports and messages. For example, the S-4 work station would receive supply status reports, emergency supply requisitions, logistic trains' locations etc. The objective of this training for each staff officer would be to know and implement all of his responsibilities during a dynamic battle and to coordinate his actions with other staff functions during the battle.

Battalion staff training could include SIMNET. A SIMNET simulator could be used to allow the commander to direct the battle from his command vehicle; this would also give the staff practice working with the commander while he is in a combat vehicle. The battalion commander also could use a SIMNET simulator to get a virtual view of combat by any subordinate in order to assist in the training of that unit. SIMNET also could be used in the logistics operation with, for example, the combat trains lead by a SIMNET vehicle and Janus supply vehicles making up the rest of the convoy.

Following the exercise, the battalion could conduct an After Action Review using only Janus or Janus and SIMNET.

3. Multi-echelon Training

Multi-echelon training with brigade and battalion staffs normally would be conducted from each unit's armory in order to enhance staff coordination within each unit and to enhance communication skills with other units. Multi-echelon training also could

involve division-and corps-level operations with active and reserve units exercising their anticipated wartime relationships.

Multi-echelon training could be a multi-media event to include a video conference with the brigade or division staff, a video tape prepared for the scenario, or a telephone conference in conjunction with STXSIM situation displays. Each battalion command post network would be linked to the brigade's wide area net. Each staff work station would receive all the reports that would normally be received during an exercise. The S-4 at brigade, for example, could arrange for ammunition resupply and issue instructions to the battalions on ammunition usage. Each battalion S-4 could practice using doctrine and tactics to make real time resupply decisions affecting field and combat trains.

A brigade training exercise might cover 24 hours of combat and logistics operations in 4-12 clock-hours. The desired learning outcomes could include:

- Brigade development of an OPPLAN, and control of forces.
- Development of a brigade-wide synchronization skills.
- Battalion implementation of the OPPLAN.
- Staff exercise of multi-echelon responsibilities.

SIMNET could be used for brigade training in essentially the same way as it is used for battalion training.

E. USE OF STXSIM AS A MISSION REHEARSAL TOOL

STXSIM could become a mission rehearsal tool. The computer support equipment and communications network are portable. The same procedures that are used for normal training could be used by single and multi-echelon staffs to plan mobilization training exercises and to evaluate alternatives for actual combat OPPLANs. A Guard or Reserve unit could be included on a STXSIM network with the active component unit for training in CONUS and for mission rehearsal in the theater. In order for STXSIM to be used in this mode, digitized terrain (mobilization training site, actual area of combat) would need to be available at the start of mobilization. Information on foe units and their expected locations can be included as it becomes available. The digital representation of the scenario and OPPLANs could be refined during mobilization, transit to the theater, and at combat locations.

F. POTENTIAL COST AND SCHEDULE

Initial development for STXSIM would include both software development and hardware acquisition. Software development would require approximately 10 man-years of effort to create the command post and network systems that are part of Guard Agent and the forward support and independent fire support battalion modules that are part of Janus. This effort could be accomplished in about one calendar year. An initial operating capability for a brigade would require computer and network facilities costing about $600,000. Additional effort would be needed to incorporate scenarios, tactical tables, measures of performance, and measures of effectiveness into data sets that could be used by units using STXSIM for training. An ongoing IDA study, *Battle Command Staff Training*,[4] is creating battle command staff tables, MOEs, and MOPs designed to train ARNG battle staffs and should be able to provide much of the necessary data for STXSIM.

---

[4] Brown, op.cit.

APPENDIX A

THE ARMY COHORT PROGRAM

THE ARMY COHORT PROGRAM

The Army Training and Doctrine Command published an assessment of the Unit Manning System and the COHORT program in March 1989.[1] This assessment identified a number of points that are relevant to this study. The points laid out below are taken directly from the assessment.

1. The most successful of the COHORT models was the nondeploying Battalion on a 3-year fixed life cycle. This model was "key to the successful conversion of infantry forces to the light division design." While it is more difficult to manage than sustained models, it offers the highest potential payoff to readiness of any model yet tried. This model has the potential to facilitate the conduct of routine TDY battalion deployments to the Sinai or to USAREUR should the need arise to reduce dependent presence in Europe. A COHORT division could support 6-month rotations efficiently by synchronizing the deployments with the COHORT unit life cycle. This would provide the OCONUS theater with a steady flow of stable, cohesive units trained to the OCONUS mission through a tailored predeployment unit training program.
2. The Walter Reed Army Institute of Research (WRARI) found that most senior commanders believed COHORT units to be more technically and tactically proficient, more synergistic and cohesive, more psychologically resistant to the potential shock of initial combat, and more willing to fight than non-COHORT units. In the 7th Light Infantry Division the COHORT process was credited with holding the units together as combat ready entities despite the unprecedented external pressures imposed on the division during its intense period of reorganization, downsizing, re-equipping, light infantry division certification, and attainment of RCF status. In heavy forces, where COHORT was not implemented well, WRAIR data finds that the COHORT companies in heavy non-COHORT battalions were generally considered better units.
3. WRAIR also found that the process of recruiting first term soldiers for the same COHORT unit, training them together in OSUT, and keeping them

---

[1] HQ U.S. Army Training and Doctrine Command, *Assessment of the Unit Manning System*, Fort Monroe, Va., March 1989, p. 1.

together for their entire first enlistment is potentially a powerful and effective combat multiplier. This process molded COHORT first termers into a cohesive, synergistic combat force whose potential could be exploited by trained leadership.

4. The bonding among COHORT leaders was generally stronger than among non-COHORT leaders. Leader bonding was not as strong as first termer bonding because leaders were not as stabilized. The bonding between first term soldiers and their leaders was generally stronger in COHORT units than in non-COHORT units.

5. Although the Army assessment was unable to come to any specific conclusions about the impact of COHORT on training readiness, the report was able to conclude that "With a proper battalion-level COHORT training program in place, one might expect commanders to conduct more efficient individual training because all first term soldiers are at the same level of training proficiency at the same time, and commanders do not have to repeat training tasks frequently to accommodate the continued trickle of new faces. One might also expect that individual skills would improve because of the more stable and consistent interface between soldier and mentor. Additionally, collective training should be progressively more complex, challenging, and realistic in the stable COHORT unit."

6. First term attrition was found to be approximately equal in COHORT and non-COHORT units.

7. External turbulence was less in COHORT units. First termers were effectively stabilized for their entire enlistment period. NCO turbulence was high because stabilization policies were not well enforced. Officers remained on the individual replacement system and their degree of turbulence proved to be a chronic and significant problem.

8. The implementation of COHORT was much more successful in light infantry units than in heavy units. Entire light infantry divisions were converted to COHORT. In heavy units, COHORT companies and battalions were mixed in with regular armor and mechanized infantry units. As a result, the heavy COHORT units were not well accepted or assimilated due to resentments caused by implementation actions that resulted in actual or perceived privileged treatment.

9. The life cycle of COHORT units led some to argue that COHORT detracted from readiness because a COHORT unit might have to report itself unready on the Unit Status Report during the time it took to complete its initial unit training. Others argued that this was simply a manifestation of the unit replacement system that should be changed and the Army should be willing

to report units as unready just as the Navy reports ships unready when they return from an overseas deployment and large numbers of sailors are reassigned.

10. The Army mastered the process of accessing, training, and delivering first term COHORT soldiers to the right place at the right time as a cohesive group.

11. The Army developed an automated system for integrating numerous Army management systems with COHORT and producing a COHORT unit schedule which is supportable and consistent with accession constraints and training base capacity. The model needs to be enhanced to include operational constraints, such as brigade organization and NTC rotation schedules.

12. The Congress enacted Variable Enlistment Legislation that allows soldiers to enlist for a period of initial training and the entire COHORT life cycle

13. The greatest challenge to institutionalizing the COHORT system is the steady-state management of the personnel flow, especially late arrival of cadre to COHORT units and COHORT unit strength profiles. Both the Personnel Command and installations have had difficulty meeting COHORT schedules, perhaps because of the need for off-line micro-management of many individual COHORT companies. Policies need to be established for managing the strength of COHORT units.

14. COHORT managers did not recognize the magnitude of the prevailing cultural mind-set about the individual replacement system. They found that the prevailing Army culture nurtures an IRS based on the primacy of the individual over the unit. This causes many COHORT initiatives to be seen as restrictive, unfair, and career-damaging. The individual replacement system is a management system of least resistance and the unit manning system restricts management flexibility and curtails command prerogatives.

15. The Unit Status Report focus on "level of fill" is not consistent with Army training philosophy and militates against the use of COHORT. This mind-set will not change until we change the unit status report to recognize and reward stability, cohesion, and collective proficiency as readiness enhancers.

16. Reductions in operating tempo caused by budget reductions could be offset by the unit stability and enhanced readiness inherent in the COHORT system.

17. Stationing of unaccompanied units in Europe could be sustained by an expansion of Sinai-type TDY rotations or establishment of Korea-type short tours. Both of these approaches can be supported by the COHORT system.

APPENDIX B

GLOSSARY

GLOSSARY

AC	active component
ARNG	Army National Guard
ARTEP	Army Training and Evaluation Program
BOS	battlefield operating systems
CATS	Combined Arms Training Strategy
CCTT	Close Combat Tactical Trainer
COHORT	cohesion, operational readiness, training
CONUS	continental United States
CP LAN	command post local area network
CS	combat support
CSS	combat service support
CTC	combat training center
FTS	full time support
IRR	individual ready reserve
JRTC	joint readiness training center
LOC	line of communication
MCCRES	Marine Corps Combat Readiness Evaluation System
METL	Mission Essential Task List
MSO	military service obligation
MTP	mission training plan
NTC	national training center
OPFOR	opposition force
OPPLAN	operations plan
OPTEMPO	operational tempo
ORE	operational readiness exercise
OSUT	one station unit training
RC	reserve component
RSO	Ready Standby Organization
SIMNET	simulation network
SRA	selected reserve augmentee

STXSIM	Situational Training Exercise, Simulation.
TCDC	Tactical Commander's Development Course
TDY	temporary duty
TES	tactical engagement simulations
TQM	Total Quality Management
TRADOC	Training and Doctrine Command
UCOFT	unit conduct of fire trainer
UCTP	Unit Cohesion Training Program
UDP	Unit Deployment Program
UMS	Unit Manning System
UPTM	Unit Personnel Tracking Model
USAREUR	United States Army Europe
USBP	Unit Standby Program
USMC	United States Marine Corps
USP	Unit Stability Program
WRAIR	Walter Reed Army Institute of Research